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AMERICAN JOURNAL OF OPHTHALMOLOGY
Volume 15 November, 1932 Number 11

X-RAY DIAGNOSIS OF DOUBLE PERFORATION OF THE EYEBALL AFTER INJECTION OF AIR INTO THE SPACE OF TENON

E. W. SPACKMAN, M.D.
PHILADELPHIA

The author presents this method as a valuable adjunct to the usual methods of localization of foreign bodies in the eye, in cases of double perforation of the globe. He has not found an original report of this method in the English literature. Presented before the Ophthalmological Section of the Philadelphia College of Physicians in March, 1932. From the x-ray department of Wills Hospital, Philadelphia.

In the localization of intraorbital foreign bodies, the importance of recognizing accurately the presence of a double perforation of the globe is fully realized. If the foreign particle has perforated the posterior sclera, and lies in the retrobulbar tissue it causes less concern than if it remains imbedded within the globe, and more conservative treatment can be safely recommended. There has been great difficulty in establishing a definite diagnosis of double perforation by x-ray methods, due to the inability to demonstrate the posterior portion of the globe, which is not of sufficient contrast on the x-ray plate to be differentiated from the bony orbit.

The inaccuracy of the geometric methods of localization, of which the Sweet method is most commonly used in this country, is well known. These geometric methods arbitrarily assume the length of the eyeball to be constant, which we know is far from true. They are recognized, however, as quite accurate in the localization of foreign bodies in the anterior hemisphere. Many foreign bodies which are localized within the posterior hemisphere on the chart, are actually in the retrobulbar tissue. This is because the eyeball may be considerably shorter than shown on the chart. The so-called physiological methods of localization give more information when the foreign particle is in the posterior hemisphere. These methods depend on movement of the globe according to some definite plan, and localization of the particle in reference to the optical center, or to some definite point on the sclera.

One of the most common tests of whether the foreign body lies within the sclera is the "parallax method". The head is immobilized with the sagittal plane parallel to the plate and the injured eye nearest the plate. The patient is instructed to raise both eyes, keeping the head still, and the first exposure is made. The patient then gazes horizontally and a second exposure is made, and finally the eyes are turned downward for the third exposure. Some

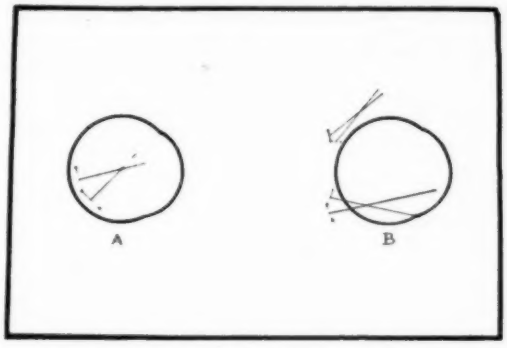


Fig. 1 (Spackman). Diagrams illustrating the parallax method (see text). A. Three images of intraocular foreign body with lines connecting them and ordinates crossing at the optical center. B. Images of two extraocular foreign bodies with ordinates crossing, either within or beyond the globe but not at the optical center.

workers make all three exposures on one plate, others use separate films and superimpose them after development. Several modifications of this procedure are used. If ordinates, drawn from lines connecting the three images of

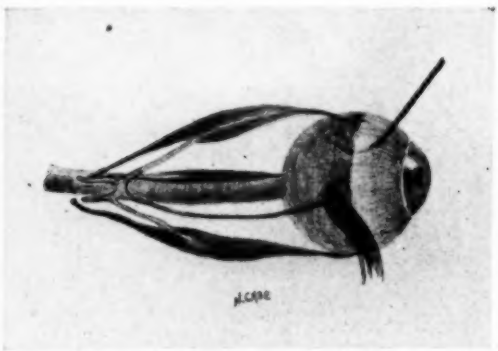


Fig. 2 (Spackman). Semidiagrammatic view illustrating method of inserting curved cannula under bulbar conjunctiva and pushing it 4-5 mm. posterior before puncturing capsule of Tenon. (Modified from Whitnall's "Anatomy of the orbit.")

the foreign particle, cross at the optical center of the globe, the foreign body is regarded as being within the globe; if they cross elsewhere within or without the globe it is regarded as being extraocular. The objection has been made that if the foreign body lies in close relation to the posterior part of the sclera, attached by the ligaments or hematoma, it will behave in the same manner as though it were intraocular, judging by this, or by any of the physiological methods. The behavior of foreign bodies that lodge in the ocular muscles has been exhaustively studied by J. Belot and H. Fraudet[1], who use a procedure similar to the parallax method and by this means determine in which of the ocular muscles the foreign body is imbedded.

The foregoing methods are of great value in checking on data obtained by the usual localization procedures, but the roentgenologist, in his practical work, sees cases in which there is still uncertainty about the exact position of the foreign body, and means were sought to clarify this problem still further. H. Gasteiger and S. Gauer[2] suggested in August, 1929, the injection of air into the capsule of Tenon, creating by this means a layer of sufficient contrast to demonstrate the posterior sclera on the x-ray plate. The Speziale-Picciché[3] method advocates injection of lipiodol for the same purpose, but this substance casts a dense shadow which might easily be confused with the foreign body or might totally obscure it.

We have had occasion to use air injection in three recent cases, according to the following method: After thoroughly anesthetizing the eye, the patient is instructed to turn it downward and inward, a point about midway between the superior oblique and external rectus is located, and the conjunctiva grasped, using sterile precaution. A cured cannula is then inserted below the conjunctiva and the needle carried between the conjunctiva and Tenon's capsule for a few millimeters

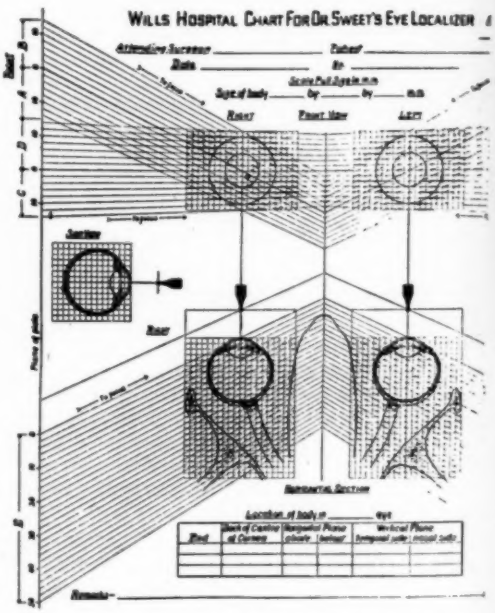


Fig. 3 (Spackman). Case 1. Foreign body appears to be imbedded in posterior sclera on the localization chart.

before puncturing the capsule. If a straight cannula is used the air will leak back below the conjunctiva and into the retrobulbar tissue. An attempt was made to inject ten cubic centimeters of air, but in our cases six to

eight cubic centimeters were sufficient. When the eye is proptosed, due to air posterior to the globe, and increased resistance is felt on the piston of the syringe we discontinue the injection. The proptosis must be apparent, and this is the best guide as to the correctness of the procedure. If the conjunctiva bulges forward the needle is not

The entire procedure causes little or no pain, patients have merely complained of a sense of pressure on completing the air injection, and have been perfectly comfortable during the examination. In four or five days the air has disappeared without inducing untoward symptoms or complications.

Case 1. R. F. was admitted for ex-

Fig. 4 (Spackman). A. Linear marks indicate the posterior boundary of the capsule of Tenon as shown by the injected air. Arrow indicates foreign body. Foreign body appears on this plate to be within the capsule of Tenon. B. Made by angling thirty degrees to face. Foreign body is now visualized posterior to the injected air.

within the space of Tenon, or there is too much leakage. In this case the test is of no value. The radiographs are made at leisure, preferably from several angles, as it is important to separate the shadow of the foreign body from that of the space of Tenon. The layer of air below Tenon's capsule forms a band which may be plainly visualized in contrast to the denser bony tissue of the orbit, and by making pictures from various angles the relation of the particle to the capsule may be accurately demonstrated.

amination, October 12, 1931, having been struck in the right eye by a particle from a stone which he was breaking. Vision, O.D. = light perception, O.S. = 5/6. The lids, sac, and conjunctiva of the right eye were normal. The cornea was clear; the anterior chamber deep and filled with blood; the pupil dilated (atropine). Fundus could not be seen. There was a dark spot on the iris at about "four o'clock," and a large laceration where the foreign body went through the cornea near the limbus at about "two o'clock."

X-ray localization was positive for foreign body (see chart). An attempted

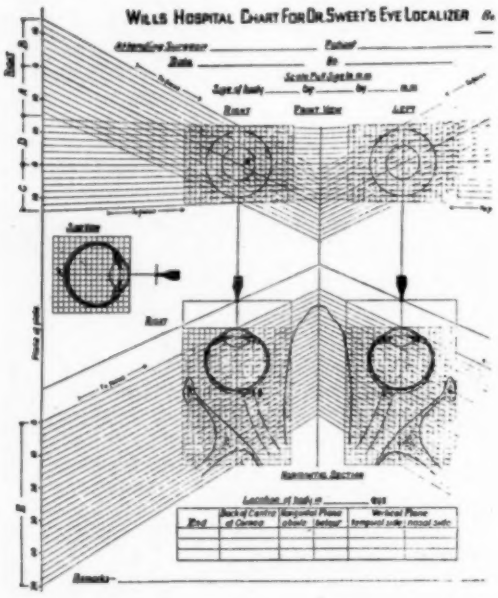


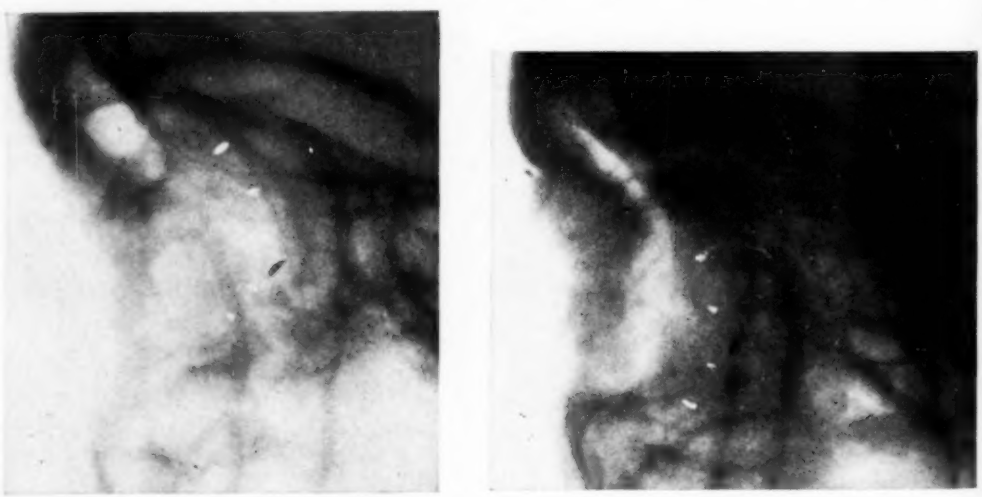
Fig. 5 (Spackman). Case 2. Foreign body appears posterior to sclera in retrobulbar tissue on the localization chart.

magnetic extraction failed and no pull was recognized.

Air-injection method of examination applied October 17, 1931. After cocaine anesthesia a needle, curved to the shape of the globe, was inserted in the bulbar conjunctiva, carried along for five or six millimeters and then, piercing the capsule of Tenon, was carried posteriorly and eight cubic centimeters of air were injected. No bulging of the bulbar conjunctiva followed, but the globe became somewhat proptosed, and at the end of the injection a swelling over the internal rectus appeared. An x-ray was taken at once.

X-ray report: A thin line of decreased density is visible which is presumed to be air in the capsule of Tenon. The foreign body appears stereoscopically definitely posterior to this area, but almost in contact with it, which would therefore indicate that the fragment is posterior to the sclera. This would definitely confirm the diagnosis of double perforation.

Case 2. D.E. admitted October 12, 1931, had been struck in the left eye, five days previously while pounding with a hammer on a piece of steel, by a particle, supposed to be steel, which had penetrated through the lower lid. The left eye was normal except for an abrasion of the lower lid, at about "5:30 o'clock". The sac was normal. There was a severe conjunctivitis and pericorneal injection. A tear was seen in the lower border of the iris, with a



A B

Fig. 6 (Spackman). A. Foreign body appears to be partially imbedded within capsule of Tenon. B. Tube angled ten degrees to the face. Foreign body is now seen to be posterior to the capsule but in contact with it.

little blood around its edges. The cornea was clear; anterior chamber normal. The pupil was dilated (atropine) and irregular. The media were hazy; the disc was normal. The fundus could not be seen clearly. Ocular muscle movements were normal. Visual fields, roughly, in both eyes were full.

X-ray localization. Positive for foreign body (see chart). In stereoscopic views of the orbits, besides the foreign body which had been localized in the posterior portion of the sclera, there was a second foreign body anterior to the left frontal sinus. An attempted magnetic extraction failed and no pull was recognized.

Air-injection method of examination was applied, October 15, 1931, after cocaine anesthesia. A needle curved to the shape of the globe was inserted in the bulbar conjunctiva and carried along for five or six millimeters, then piercing the capsule of Tenon, was carried posteriorly, and six cubic centimeters of air injected. This caused proptosis of the globe. An x-ray was taken at once.

X-ray report: A thin line of decreased density is visible which is presumed to be air in the capsule of Tenon. The foreign body appears stereoscopically definitely posterior to

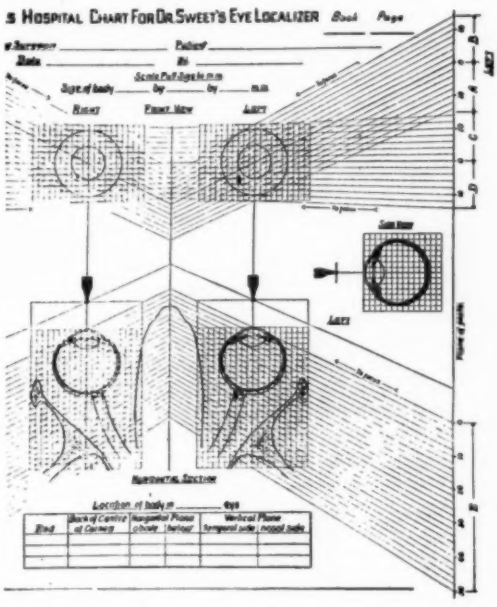
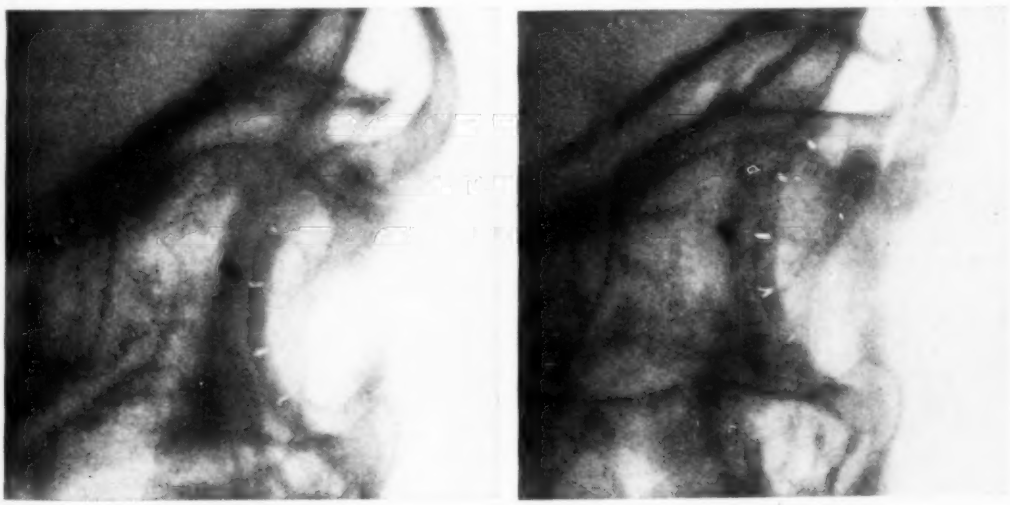


Fig. 7 (Spackman). Case 3. Foreign body appears to be imbedded within the posterior portion of the sclera on the localization chart.

this area, which would therefore indicate that it lies in the retrobulbar



A B

Fig. 8 (Spackman). A. Foreign body appears partially imbedded in the capsule of Tenon. B. Tube angled ten degrees to the face. Foreign body is now shown posterior to the capsule.

Note: The air injected into Tenon's capsule appears as a thin band of decreased density indicated by linear markings.

tissue, thereby confirming the diagnosis of double perforation.

Case 3. S.K. admitted for examination October 19, 1931. Three days ago, as a friend was shooting a revolver while standing three feet behind the patient and to his left, he suddenly noticed loss of vision in the right eye.

Examination indicated ocular movements and convergence good. The right globe was slightly injected, the pupil widely dilated (atropine), and the cornea presented a slightly raised scar upward and inward from the summit. The lens was almost completely opaque except for a narrow zone at the periphery, through which riders extended, giving the appearance of numerals on the dial of a clock. The media of the left eye were clear and the fundus negative. An oblique examination revealed a scar of the cornea, behind which was a fairly great disturbance of the anterior capsule.

X-ray localization: Positive for foreign body (see chart). Cocaine was used in the right eye and both hand and giant magnet applied but without response or pull at any point of the globe. On further questioning the patient was unable to tell whether the foreign body was of a material that would be magnetic or not. His brother failed to write him, as requested, concerning the examination of the gun.

October 31, 1931, the air-injection method of examination was used. After cocaine instillation a needle curved to the shape of the globe was inserted below the bulbar conjunctiva and carried along for five or six millimeters, then piercing the capsule of Tenon was carried posteriorly. Eight cubic centimeters of air were injected.

There was no bulging of the bulbar conjunctiva, but the globe became slightly proptosed, and the patient complained of discomfort with dull pain back of the eye. Injection was discontinued and the patient taken to the x-ray laboratory.

X-ray report: Air was present in the capsule of Tenon and the foreign body was definitely demonstrated lying posterior to the injected air; hence this must be regarded as a double perforation.

Summary

1. Injection of air into the space of Tenon as an aid in the diagnosis of double perforation is recommended where other measures fail to establish the diagnosis definitely.

2. The method is not original, but follows the procedure of the authors quoted in the text.

3. The simplicity of the procedure and its apparent freedom from objectionable features thus far, make it worthy of discussion and further trial.

1824 Chestnut street.

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HYPERPHORIA AND THE PROLONGED OCCLUSION TEST

CARL BEISBARTH, M.D.
SAINT LOUIS

As a measure of hyperphoria the prolonged occlusion test is declared unsound because there is a marked tendency for the occluded eye to deviate upwards. Twenty-nine cases are cited. Read before the Saint Louis Ophthalmic Society, March 25, 1932.

The tendency of the eyes to turn upward, or upward and outward, when closed as in sleep or in the early stages of anesthesia has been known as Bell's phenomenon. Recently Abraham[1] reinvestigated this phenomenon and concluded that it was essentially a protective mechanism and belonged to the group of instinctive reflexes. He states that practically all individuals show a typical Bell's phenomenon, and that a tendency toward this protective turning is also noted when the eye is simply shielded or when in darkness without fixation.

The shielding of one eye as a means of uncovering latent imbalances of the ocular muscles has been more or less widely used by clinicians since it was first advocated by von Graefe. Marlow[2] insisted that the test would have infinitely greater value if the eyes were dissociated for from three to seven days, thus permitting each eye to assume a position of muscular rest, uninfluenced by the need for binocular single vision. He has been an ardent advocate of prolonged monocular occlusion as a means of determining the nature and degree of muscular imbalances, and has received the support of a number of distinguished clinicians.

Since the publication of Abraham's[1] paper on the relation of Bell's phenomenon to the prolonged occlusion test, serious doubts as to the value of this test in determining latent heterophorias (and especially hyperophorias) must have arisen in the minds of many clinicians. While some ophthalmologists have never admitted the value of Marlow's test, many have expressed firm belief that it is the most satisfactory one for estimating the true amount of hyperphoria. DeSchweinitz[3], in discussing a paper by Appleman says, "In my experience when the hyperphoria is latent the Marlow method of uncovering is a most satisfactory one." Holloway[4], O'Connor[5], Barkan[6], Brown[7], and others have used the test with good results. Duane[8] never agreed that the method was valuable, and repeatedly hinted that the prolonged occlusion test did not reveal a true hyperphoria, but caused an artificial dissociation of the visual planes.

In spite of its inconvenience to the patient, the test is frequently, but by no means universally used. We rarely find patients unwilling to cooperate by permitting occlusion of one eye when the purpose of the test is explained to them. However, in examining the office records of patients on whom this test was performed, facts were revealed which urge the rejection of the method on grounds other than its impracticableness. Fortunately, many records showed definitely which eye was occluded. The time occluded was recorded in all cases, because this was thought to be the most important factor.

The cases presented in the table represent all cases found in which the following facts were recorded: (1) the amount of hyperphoria before occlusion; (2) the eye occluded; (3) the method of occlusion; (4) the time occluded; and (5) the hyperphoria after occlusion. The group does not represent cases selected to prove an assumption. All cases found in the records examined, which included the above facts, are presented. None of the cases represent an experiment in the occlusion test. They are records of therapeutic tests, completed and recorded before the idea had been entertained that the result of a prolonged occlusion test depended greatly upon which eye was occluded.

The tests were made with a Maddox rod and prism bar with a 10 mm. light

source at 6 meters. Patients were always warned of the necessity of carrying out the test without interruption. The ranges were darkened, and great care was always taken to center the lenses properly, because the tests were used as a basis for incorporating prisms in the corrections of these patients.

In the first nine cases, which showed a left hyperphoria before occlusion, the left eye was occluded in each case. In none of these nine cases was the hyperphoria less after occlusion. In all but two cases (no. 3 and no. 6) there was an increase in the hyperphoria after occlusion, which varied in time from one and one-half hours to seven days.

In the next seven cases (nos. 10 to 16 inclusive) which originally showed a right hyperphoria, the right eye was occluded in each case. Six of these cases showed an increase in the right hyperphoria of considerable degree. In case no. 10 the right hyperphoria of two and one-half degrees was changed to one of five degrees after twenty-four hours of occlusion. In case no. 13, six degrees of right hyperphoria were present when two and one-half degrees had been recorded before the comparatively short occlusion. In only one case (no. 12) was the hyperphoria less after the test, a vertical orthophoria being present after four days of occlusion, when one-half degree of right hyperphoria had been present before.

The next eight cases tabulated (nos. 17 to 24 inclusive) had exhibited no hyperphoria before the occlusion test. In five of these cases the left eye was occluded; two of these exhibited left hyperphoria of one and one-half and one, one and three-quarters degrees after comparatively short occlusions. In three cases in which there was no hyperphoria before occlusion, the right eye was occluded. Two of these showed a right hyperphoria after occlusion,

Case No.	Age	Refraction	Hyperphoria before occlusion	Eye occluded	Method	Time	Hyperphoria after occlusion
1.	32 years	H AH	L. HYP 1½	L.	G.G.	15 hours	L. HYP 3½
2.	55 "	H AH	L. HYP ¼	L.	G.G.	24 hours	L. HYP 1¾
3.	31 "	H AH	L. HYP 1	L.	G.G.	4 days	L. HYP 1
4.	68 "	H AH	L. HYP 1½	L.	G.G.	6 days	L. HYP 2
5.	35 "	M AH	L. HYP ½	L.	G.G.	6 days	L. HYP 2
6.	45 "	H AH	L. HYP 2½	L.	B.P.	1½ hours	L. HYP 2½
7.	26 "	H AH	L. HYP 1	L.	B.P.	24 hours	L. HYP 4
8.	29 "	M AH	L. HYP ½	L.	B.P.	24 hours	L. HYP 2
9.	40 "	H AH	L. HYP 1½	L.	B.P.	2 hours	L. HYP 2
10.	58 "	H AH	R. HYP 2½	R.	B.P.	24 hours	R. HYP 5
11.	30 "	AH	R. HYP 1	R.	B.P.	9 days	R. HYP 3
12.	28 "	AH	R. HYP ½	R.	G.G.	4 days	None
13.	62 "	M AM	R. HYP 2½	R.	B.P.	2½ hours	R. HYP 6
14.	48 "	H AH	R. HYP ¾	R.	B.P.	24 hours	R. HYP 1½
15.	38 "	H AH	R. HYP 2	R.	G.G.	4 days	R. HYP 3½
16.	43 "	H AH	R. HYP 1	R.	B.P.	1½ hours	R. HYP 2
17.	58 "	H AH	None	L.	B.P.	2½ hours	L. HYP 1½
18.	26 "	M	None	L.	B.P.	2 hours	None
19.	24 "	M AM	None	L.	B.P.	1 hour	None
20.	41 "	H AH	None	L.	B.P.	2 hours	L. HYP 1¾
21.	44 "	M AH	None	L.	B.P.	2 hours	L. HYP 1½
22.	48 "	H AH	None	R.	G.G.	8 days	R. HYP ¾
23.	22 "	H AH	None	R.	B.P.	3 hours	R. HYP ¾
24.	40 "	H AH	None	R.	B.P.	2 hours	None
25.	27 "	AM	R. HYP ¾	L.	G.G.	4 days	L. HYP 2½
26.	60 "	H AH	R. HYP 1	L.	G.G.	7 days	L. HYP ¾
27.	34 "	M AM	R. HYP 1	L.	B.P.	24 hours	R. HYP ½
28.	48 "	H AH	R. HYP ¾	L.	B.P.	24 hours	R. HYP ½
29.	57 "	M AH	R. HYP 1½	L.	B.P.	1½ hours	R. HYP ¾

G.G. = Ground glass
B.P. = Black patch

and, while the degree was not high, the occlusion time was short and the tendency was always toward a hyperphoria of the covered eye.

The results in the last five cases (nos. 25 to 29 inclusive) seem especially interesting. In each case there was a right hyperphoria present at the initial test. The left eye was occluded in these five cases. In case no. 25 the right hyperphoria of three-fourth degrees was replaced by a left hyperphoria of two and one-half degrees after four days' occlusion of the left eye. In no. 26 a right hyperphoria of one degree before occlusion was revealed as a left hyperphoria of three-fourths degree after seven days occlusion of the left eye. In the last three cases listed the occlusion time was shorter, but in each case the right hyperphoria was less after covering the left eye.

From these results it seems that the use of the prolonged occlusion test to estimate the amount of hyperphoria to be corrected prismatically would lead us into error. Few users of the test have been willing to prescribe the full correction found after occlusion, and this may account for the good results and satisfaction with the test reported by many authors. As is well known, many individuals can withstand the wearing of surprising miscorrections in refraction with comfort, especially when they are bolstered up by the psychological effect of the examiner's test and manner. This may also be true of prismatic miscorrections. Others, possessing more delicately poised nervous systems, must have the most exactly estimated lenses if they are to be comfortable, and it is probably only from this latter group that we, later, must remove the prisms prescribed on the basis of a prolonged occlusion test.

1002 Beaumont Medical building.

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OCULAR PAPILLOMATA

WILLIAM BROWN DOHERTY, M.D.
NEW YORK CITY

Two cases are described and the literature reviewed. These tumors are dangerous because they are potentially malignant.

In reading a chapter in a well known pathology of the eye on teleplasms arising in parts derived from cuticular epiblast I find that thickening of the epithelium on the surface without downward extension, gives rise to *innocent* new formations termed papillomata.

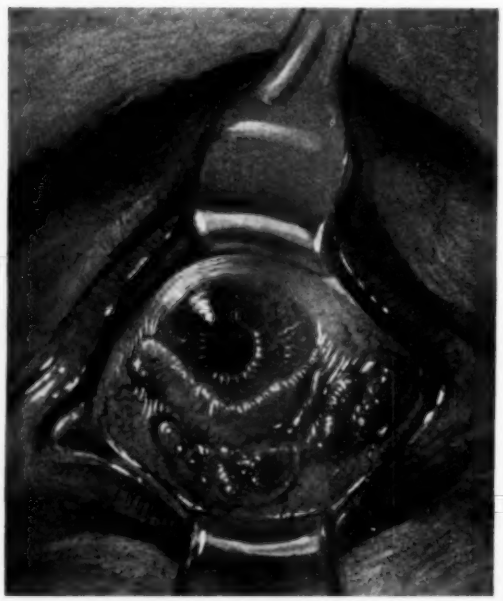

Fig. 1 (Doherty). Case 1. Multiple papillomata.

In reviewing the literature I was surprised indeed to learn of the number of cases of papilloma of the cornea and corneo-scleral margin that presented both clinically and microscopically all the characteristics of these new growths and later developed malignant degeneration.

Before discussing briefly the literature of this interesting subject I wish to present the following case. The patient first consulted me for examination one month ago and I obtained the following history. He was a man fifty-six years of age, weighed one hundred and ninety-five pounds and had enjoyed unusually good health. Five years ago he first noticed a slight redness around the corneo-scleral margin of his left eye and very soon a number of pimples made their appearance at the corneo-scleral margin below. These grew very fast, seemed to coalesce and had the appearance of granulation tissue. He said that at the end of the first five months there had been no material change in the picture of the growths, and that for the last four and a half years he thought his condition was unchanged. I could obtain no history of ocular injury and none of malignancy in any of his immediate family.

The vision of the eye was reduced to 20/70 which could not be improved with glasses. This reduction in vision was caused by a certain amount of irregular astigmatism due to the tendency of the growth to split the superficial layers of the cornea. The tumor itself consisted of a number of mushroom-shaped globules having the appearance of granulation tissue. They were reddish in color and while freely

Fig. 2 (Doherty). Case 1. Microscopic section of papilloma.

movable were firmly attached to the sclera by a pedicle. The blood supply was very rich and the mass bled easily. The tension of the eye was normal, transillumination negative and the media failed to show any pathology. A biopsy was performed and the report from the pathological department of the New York Eye and Ear Infirmary was as follows: The growth presented thickened squamous epithelial cells thrown up into irregular folds by projection of the stroma. The basement membrane of the epithelium was well preserved. There were no evidences of malignancy. Diagnosis. Papilloma.

It was my intention to excise the growth and later treat the area with radium, but one week ago the patient suddenly developed an intestinal obstruction and was removed to a hospital. A laparotomy was performed and a very advanced carcinoma of the stomach was discovered. He died a few days later.

Case two was that of a young lady, thirty years of age, who stated that in December, 1928, she first noticed a small tumor about as big as a black-headed pin situated in the inner canthus of the right eye. The growth was removed during the middle of February by an ophthalmologist and three months later she noticed a recurrence, the mass growing very rapidly.

She first presented herself to me for examination in September, 1929, at which time three distinct tumors were discovered. The largest growth, about one-quarter of an inch in diameter, was situated on the edge of the upper lid about 2 mm. to the nasal side of the upper punctum. It resembled a small raspberry both in color and form, and was attached by a rather firm pedicle. A second tumor resembled the first being rather smaller and paler in color. It sprang from near the edge of the semilunar fold. A third tumor consisted of four or five lobules or small papillæ, having a slightly pinkish mushroom appearance and attached to the caruncle. All the growths had firm pedicles, bled easily when injured and were easily removed under local anesthesia, leaving practically no scars. The patient has had radium treatment by a competent surgeon and no recurrence has taken place so far.

The microscopic examination was identical with that of the first tumor; namely a typical picture of a papilloma with no evidences of malignancy.

The first true pathological description of a papilloma is recorded by Gayet[1] in 1879. This occurred in a man sixty-nine years of age, involved the whole cornea and consisted of papillæ covered with epithelium in the position of Bowman's membrane. Ayres[2] reported a similar case. Stephenson[3] and Hepburn[4] also report questionable cases of papilloma of the corneo-scleral margin. One case followed a slight ocular injury.

Lauber[5] gives instructive reports of two cases. A man aged forty-three years, with old trachoma, developed a growth which was removed. Microscopic examination proved it to be a papilloma. In another case a woman aged sixty-two years injured her right eye with lime and three years later a papilloma developed, which was removed. In the author's opinion both cases demonstrate quite in accord with general experience that papillomata of the cornea always develop on the soil of former vascularization brought about by inflammatory or traumatic processes.

Faith[6] states that in a man twenty-eight years of age a papilloma (?) was discovered on the conjunctiva at the corneo-scleral margin. The tumor had been operated on many times but after four months' treatment with x-ray the growth disappeared with no recurrence in three years. Stieren[7] describes a papilloma (?) which appeared as a cauliflower growth of mushroom shape somewhat resembling a pale-red raspberry. It extended from the external canthus, overlapped the cornea to its center and projected between the lids. There was no involvement of the lymphatic glands. The tumor was removed and pronounced an epithelioma of the papillomatous type. There was no recurrence.

Birch-Hirschfeld[8] reports a papilloma (?) occurring in a man being

treated for trachoma. After excision and cauterization the growth did not return. Veasey[9] refers to a case of epibulbar epithelioma which probably began as a papilloma and later became malignant.

Coover[10] reported a case of a papilloma (?) of the cornea in the right eye of a recurrence of the growth until in March, 1913, ten years later. The patient noticed its recurrence and presented himself for treatment. The tumor grew very rapidly and a year later it completely covered the cornea and ocular conjunctiva projecting over the lower lid and pushing up the upper lid.

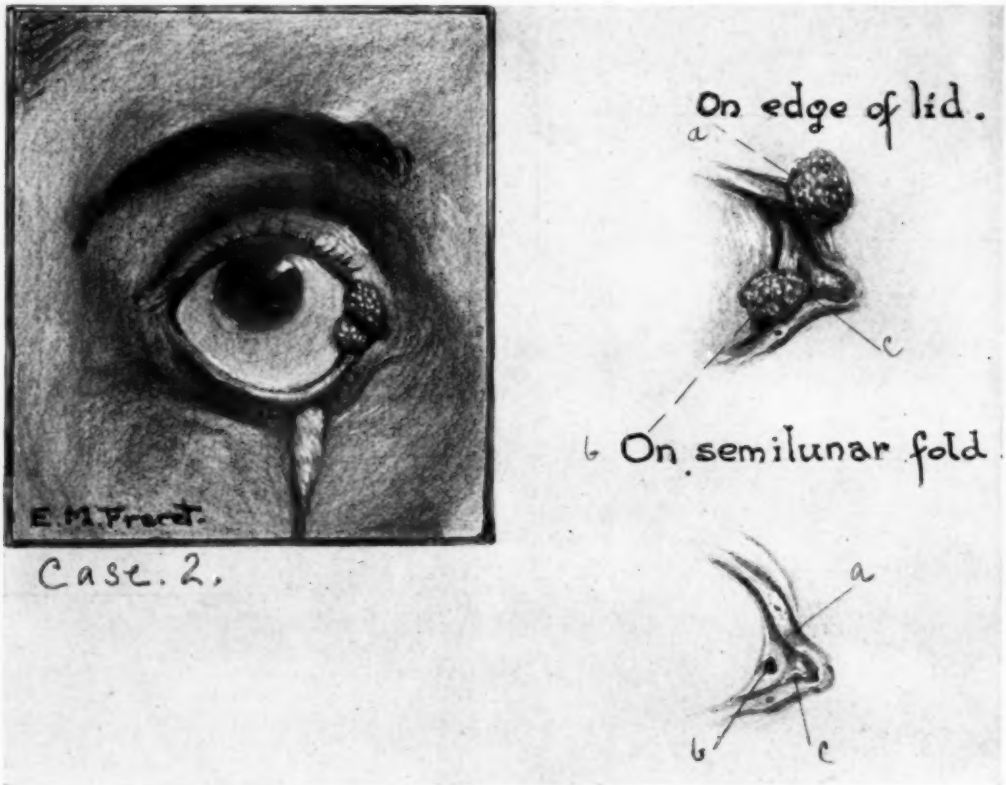

Fig. 3 (Doherty). Case 2. Multiple papillomata.

of a man sixty-six years of age which started from a cicatrix where a supposed pterygium had been removed. The growth grew very rapidly, projected over the margin of the lower lid and invaded the outer half of the cornea, extending around on the lower and inner part of it. It had a cauliflower, raspberry appearance and was made up of clusters of soft papillæ. They were movable and surrounded by a loop of vessels from which they seemed to spring. The growth was removed and a pathological examination proved it to be a true papilloma of the cornea. The eye showed no evidences

The palpebral fissure was almost obliterated by the growth. The secondary recurrence presented the same cauliflower and raspberry appearance as the first tumor, consisting of small clusters of soft papillæ surrounded by groups of vessels which bled freely when moved. The eye was enucleated and a microscopic examination showed irregular masses of epithelial cells separated from one another by thin bands of connective tissue. The epithelial cells were of the basal cell variety, some of them showing signs of karyorrhexis. There were also evidences of accumulations of colloid substance.

Pathological diagnosis was basal cell epithelioma.

Contino[11] discusses the clinical history and histology of eleven cases of papillomata of the limbus. Two forms of papilloma are distinguished: the first characterized by enormous proliferation of the epithelium as compared with a scanty formation of connective tissue papillæ and second, a large form in which the proliferation of connective tissue at least equals the epithelial growth. The first type is more benign, more frequent, triangular in shape and is liable to be mistaken for a pterygium or a large phlyctenule. The growth occurs as a fleshy excrescence of smooth surface and sharp outlines, usually opposite the palpebral fissure. The second type is rare, has a mulberry appearance, is more adherent and passes without sharp borders into the surrounding epithelium. The author believes that the limbus tumor originates from a hypertrophy of the epithelium, with reaction of the connective tissue and consequent enlargement of the small papillæ which normally appear in this region. Secondary causes are trauma and continued irritation of the eye. Rosenhauch[12] reports three cases of limbus papillomata. One case presented multiple growths simultaneously in each eye. A second case, after the excision of the growth which had the typical histological structure of a papilloma, two months later developed a recurrent mass which proved to be a carcinomatous degeneration.

De Schweinitz[13] gives the history of a most interesting case. The patient, a man aged eighty, received an injury to his left eye by contact with the spines of the fin of a fish which struck him violently in the corner of the eye and occasioned a stubborn traumatic conjunctivitis. Three to five years later a papilloma developed at the corneoscleral margin. The tumor was excised and had the characteristic pathology of papilloma with the exception "that in one spot there was an appearance suggesting pearly body formation". Nine years after the removal of the primary papilloma the patient was again admitted to the hospital and the left eye then presented a large fungus-looking mass protruding through the lids, arising from the upper corneo-scleral region, overhanging and partly adherent to the cornea in front. The removal of the eyeball and orbital contents was advised, and this procedure was adopted. The tumor was found to be an epibulbar carcinoma.

Weidler[14] states that in a man sixty-one years of age, a papilloma developed. The tumor had been growing for three years and at one point there was some indication of carcinomatous change. Garraghan[15] gives the history of a patient aged seventy, who was a stone cutter by trade. One year before examination the patient noticed a small red spot on the eyeball at the inner canthus. This small tumor-like mass gradually increased in size until it covered four-fifths of the cornea. There was no history of pain or hemorrhage. The patient sought relief because of diminution of vision. The tumor presented an extensive granular raspberry appearance, it was firmly attached to the corneo-scleral margin and freely movable. From a firm attachment at the limbus it spread like a fan between the upper and lower lids and extended over the caruncle to the farther point of the inner canthus. The tumor was attached to a small area of the cornea on the nasal side and spread out loosely like a flap over the cornea. It bled readily, and there was no involvement of the eyelids or of the lymphatic glands. A microscopic examination showed the growth to be a typical papilloma. The growth recurred several times and cauterization was necessary.

Böhm[16] found described in literature, cases of papillomata of the conjunctival cornea by Reis, Agricola, Piccaluga, Schäfler and others previously quoted by him. He states that there are two contrary opinions as to the etiology of papilloma: (1) An inflammatory growth and (2) a tumor *sui generis*. He also says that a tumor in contact with the limbus can only be explained by epithelial genesis while a papilloma of the cornea without contact with the

limbus can only be caused by inflammatory processes of the cornea. He reports three cases. One occurred following injury to the left eye by sawdust which produced a prolonged conjunctival irritation. A second case had in addition to the papilloma of the corneo-scleral margin an epithelioma of the cheek. The tumors were excised and treated with radium and the author concludes that for corneal papillomata the operative treatment is by far superior to radiotherapeutic treatment; not especially on account of the short duration of the treatment but princially because radiation leaves the cornea with a denser vascularized cloudiness than before.

Sempe and Dejean[17] report a case of voluminous papilloma of the cornea. The tumor in question was a whitish semi-hard mammillated mass covering practically the entire surface of the cornea and in places impinging on the sclera. In spite of its somewhat slow evolution, clinical diagnosis left a doubt as to whether it was an epithelioma or a papilloma. Histological examination favored the latter but there were places where the epithelium seemed to break through and spread out in disorder. The possibility of malignant changes in such cases call for prudent measures and the author concludes the such eyes which are functionally useless should be enucleated.

Summary. From the history of the literature papillomata are by no means innocent growths. While they have been considered only locally malignant a number of cases that have been reported by reliable authors seem to prove conclusively that they are capable of malignant degeneration.

These tumors occur most frequently at the inner canthus and the corneo-scleral margin, rarely in the cornea proper. The marginal variety can be best explained by an epithelial genesis while those in the cornea are in all probability caused by an inflammatory process. Vascularization brought about by inflammatory or traumatic processes is a most favorable soil for these growths so that ocular injuries and prolonged irritation are causative factors.

Even though the growth is clinically and histologically a papilloma, sufficient evidence is recorded in literature to warrant repeated examinations after the removal of the growth and a careful search for evidences of malignancy in other parts of the body.

A most careful examination of the sections of these growths should be studied for signs of degenerative changes.

These tumors are best removed by surgical means and in spite of the poor report of radiotherapy by Böhn, the surgical treatment should be followed by radiotherapy. The radium should be used with great caution, only by one skilled in its use who thoroughly understands the possible ocular complications.

The characteristic appearances of these growths are clusters of small papillæ, pinkish-red in color and of a raspberry, cauliflower or mushroom appearance. They are freely movable, attached to their base by a firm pedicle, have a rich blood supply and bleed easily. The flattened mushroom type is produced in all probability by the pressure of the upper lid, and the raspberry like appearance is assumed by those capable of protruding through the palpebral aperture.

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INTRAOCULAR FOREIGN BODY WITH BACILLUS WELCHI INFECTION

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A case of this rare infection is reported and the literature reviewed.

The wide distribution and frequent occurrence of gas gangrene in general surgery would lead one to anticipate a greater incidence of this condition in eye surgery than a survey of the literature indicates. The intraocular contents furnish ideal culture media of the anerobic variety in which the Bacillus welchi flourishes. I have been unable to find any cases reported from this country, but European observers have reported nine cases, all of which followed penetrating wounds of the globe, and usually were in cases of retained foreign body.

Chaillous[1], of Paris, reported a case in 1904, and another in 1905. The organism was cultured and positively identified as B. welchi in both cases.

Darier[2], in 1906, reported two cases. Identification of the organism was by its appearance in conjunctival smears only, and lacking cultures, the diagnosis appears somewhat doubtful. Gas bubbles, however, were seen adhering to the foreign body in one of his cases.

All of the above cases were terminated by enucleation.

James[3], in 1910, reported in the British Journal of Ophthalmology, a case which presented gas bubbles in the anterior chamber. The organism was identified by culture. The case terminated in evisceration on the fifth day.

Heath[4], in 1929, reported in the British Journal of Ophthalmology, a case in which the organism was identified by culture. This case also terminated in evisceration.

Ridley[5], of London, in 1929, reported in the Transactions of the Ophthalmological Society of the United Kingdom, a case of gas-gangrene pan-ophthalmitis developing twenty-four hours after penetrating injury of the globe. The organism was identified culturally. Evisceration was performed eight hours after onset of evident infection.

Hamilton[6], of London, in 1930, reported in the British Journal of Ophthalmology, two cases of pan-opthalmitis due to B. welchi infection. In both cases the organism was identified culturally and the cases terminated in evisceration, one on the third and the other on the fourth day after onset.

Report of case: T. V. aged 43 years, a robust male, with previous history irrelevant was admitted to the Brooklyn Eye and Ear Hospital, January 20, 1932. He gave a history of having felt something strike his right eye at ten o'clock the previous evening while engaged in cutting a nut off a motorcycle in the cellar of his home. He went immediately to a general hospital where he was assured that the eye was only bruised and showed no foreign body. He returned home and passed a comfortable night, but at 10:00 a.m. the following morning pain was felt in eye. As this increased in severity, he applied at the Brooklyn Eye and Ear Hospital that afternoon.

Examination at 2:00 p.m. revealed temperature of 98°; pulse, 76; respiration, 18; the lids were slightly edematous, conjunctiva moderately chemotic. A small perforation of conjunctiva and sclera was noted in the horizontal plane 2 mm. internal to the limbus. A moderate hematoma had collected under the conjunctiva below the limbus. The cornea was steamy, pupil 3 mm. in diameter, iris congested, anterior chamber shallow, aqueous slightly blood tinged, vision nil and there was no fundus reflex. The globe was stony hard and presented the appearance of an active pan-ophthalmitis. The patient was suffering agonizing pain, for the relief of which morphine was immediately administered hypodermically. The x-ray revealed a foreign body 2 x 4 mm. located 20 mm. behind the anterior surface of the cornea, 4 mm. below the horizontal plane and 6 mm. nasally to the vertical plane.

The patient was removed to the operating room at 7 p.m. Chemosis had increased by that time until large folds protruded from the palpebral fissure. Separating these, the pupil was found fully dilated and a gas bubble 5 mm. in diameter occupied the anterior chamber. The giant magnet was applied to the scleral wound but no pull was obtained. A probe-pointed Bowman knife was then entered in the scleral wound and passed backward without resistance for a distance of 20 mm. in the direction of the foreign body. The knife had penetrated no further than 10 mm. when foul smelling gas, blood-tinged fluid, fragments of ciliary body, and later, vitreous, escaped around the shank of the knife. This flow stopped immediately when the knife was withdrawn but returned with each entrance of the knife into the wound. Evidently an injured portion of the ciliary body was acting as an effective valve, preventing the escape of both gas and fluids from the globe when not displaced by the instrument. With the knife in position the magnet was attached and a mild pull was several times detected but the foreign body could not be drawn forward. With the escape of intraocular contents, the tension dropped and pain ceased, but the appearance of the bubble in the anterior chamber was unchanged. The patient refused removal of the eye and was returned to bed. The following morning his temperature was 102°; pulse 100; respiration 24. Chemosis was less, the gas bubble had disappeared and the anterior chamber was filled with blood. The globe was again stony hard, and bulging of the entire limbus extending to the scleral wound was noted. Pain was again intense and the patient consented to enucleation. During administration of the anesthetic the globe ruptured spontaneously, beginning at the scleral wound and extending into the limbus, which it followed for two-thirds of the corneal circumference. The eye was enucleated, bleeding controlled with hot tampons, the cavity flushed with hot saline and the incision closed with interrupted sutures. Only moderate reaction followed. The wound healed promptly without swelling or discharge and the patient was permitted to leave on the sixth day.

Conjunctival smears taken on admission showed numerous leucocytes and staphylococci, a few Gram positive and Gram negative bacilli. Conjunctival cultures taken after rupture of the globe and extrusion of ocular contents into conjunctival sac, showed only staphylococci. Intraocular cultures grown under anerobic conditions showed a few staphylococci and many typical B. welchi. In some of these cultures the growth of the organism and generation of gas was so vigorous that the stoppers and large portions of the media were blown entirely out of the test tubes.

Comment. This case presented the classical features in mode of infection, period of incubation and course. Ridley states that, given severe pain, rise of tension and hemorrhage within twenty-four hours following penetrating wound of globe, a diagnosis of B. welchi infection should be made without further evidence.

As will be noted, French surgeons enucleated all such cases, while Englishmen resorted to evisceration, some operators taking the precaution to leave a 2 mm. strip of corneal tissue, to avoid grasping the conjunctiva with forceps, and to leave the wound unsutured four or five days to avoid giving entrance for the organism to post-orbital tissues. In none of the reported cases was there any invasion of adjacent tissues, whether enucleation or evisceration was practiced. In my case, with ordinary enucleation, irrigation and immediate closure of the wound, healing was as prompt and kindly as is usually seen after removal of an uninfected globe.

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VISUAL FIELDS, BLIND SPOTS, AND THE OPTIC DISCS IN ENDOCRINE DISEASES

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In fifty patients with endocrine disturbances, seen over a period of two years, ocular examination showed no deviation from the normal in respect to visual fields, blind spots, and color of discs, characteristic of the disease. There were no abnormal findings even in cases showing the most evident and serious endocrine disease. Read before the Chicago Ophthalmological Society, March 21, 1932. From the departments of ophthalmology and medicine, Northwestern University Medical School.

In 1929 Rowe[1] and his collaborators published a volume concerning endocrine studies. Among other factors reported were ocular investigations. The number of visual-field changes appeared enormous. Detailed reference to these findings will be made later; however, their report stimulated this investigation. With the establishment of a separate endocrine clinic apart from the usual medical clinic at Northwestern University Medical School in charge of one of us (H.R.R.), this study was begun about two years ago. The present communication deals with fifty endocrine patients seen over this period of time in regard to visual fields, blind spots, and coloration of the optic discs.

The literature concerning this phase of ophthalmology is indeed scarce and confusing. A short review would therefore seem pertinent. It is most natural because of its anatomical situation in relation to the visual pathways, and because of its physiological connection with the gonadal organs, especially noted during pregnancy, that the pituitary gland should be considered of unusual importance for study. As early as 1914 Oppenheim[2] expressed the opinion that certain toxic substances which might produce optic-nerve degeneration might be derived from the pituitary gland where no actual enlargement of the gland was demonstrable. From his experience in viewing the discs of pituitary disorders without signs of gross enlargement of the gland, Benedict[3] described a waxy pallor of the disc not accompanied by loss of substance. He explained[4] that the color indicated a vitality of the nerve in which good recovery could be expected. This type of disc has become known as the yellow or waxy disc. The basic work concerning changes in the pituitary gland during pregnancy was done by Erdheim and Stumme[5]. They were able to demonstrate enlargement of the gland proportional to the number of pregnancies. Reports of visual-field studies on pregnant women are frequently found in the literature. The "bone of contention" seems to be the theoretical consideration of whether the changes are caused by an actual anatomical enlargement of the gland or upon toxic influences on the optic nerves. Two separate authors have recently reviewed the entire literature concerning the visual fields in pregnancy. The one, Johns[6] discusses the pros and cons as to the analysis of the

findings, and the theories derived therefrom, and concludes from her own study that pregnant women show a concentric contraction of form and color fields with enlarged blind spots dependent on toxic influence rather than on actual pituitary enlargement which may or may not be considered as pathological. The other, Fischer[7] cites a case which he believes is due to cellular changes in the pituitary gland. The classical treatise of Cushing[8] concerning pituitary-gland disorders needs no comment. In the Bowman lecture for 1923, de Schweinitz[9] has given a minute investigation of the pituitary disorders exclusive of the usual central and peripheral hemianopic field defects. In spite of a thorough and painstaking search he was unable to draw any definite conclusions concerning our subject. Hill[10] felt that even in cases of hypofunction of the pituitary gland he was able to demonstrate visual field changes. As a fitting end to the review of pituitary disorders the case of Rowland[11] is most appropriate. An individual with signs of posterior-lobe overaction, with anterior-lobe deficiency, when treated with anterior-lobe pituitary extract recovered almost entirely an absent left visual field.

Holloway, Fry and Wentworth[12] have reported on the ocular findings in hyperthyroidism. They found that the toxic group had somewhat smaller fields than the non-toxic. Scotomas were found in seven of the one hundred cases, three being relative for red only. No especial emphasis is placed on these field studies. From the Evans Memorial a report was made in 1925 by Rowland[13] on ocular changes found in their cases of endocrine dysfunction. In the thyroid group of sixteen cases, seven, or forty-three percent had positive eye findings including enlarged blind spots, contracted fields, vascular changes, and yellow discs. The gonadal group had a percentage of 35.7. Eighty percent of the adrenal cases had positive eye disturbances. In the pituitary group over seventy-eight percent showed these changes. Out of the entire series of 280 cases, 180 had positive eye findings. Peter's[14] comment is interesting. He says: "With all due allowance, the number of enlargements of the blind spot in the series is of sufficient magnitude to claim our attention".

In discussing general methods for diagnosis in endocrine disorders, Rowe[15] makes the statement, "In skilled hands the eye examination is probably more generally suggestive and informative than any other one special examination both in endocrine disease and in other non-endocrine, localized, or general derangements".

In their résumé of eye findings in pituitary disorders, Rowe and Lawrence[16] found eighty-four cases out of four hundred, which had the following percentages.

Choked discs	3 percent
Yellow discs	19 percent
Hazy discs	10 percent
Optic atrophy	1 percent
Vessels sclerosed	3 percent
Contracted visual fields	29 percent
Enlarged blind spots	64 percent

In their series[17] of male and female gonadal cases, out of ninety patients examined seventy-two gave positive eye findings. Enlarged blind spots were found in forty-six and disc defects in twenty-four. Of the patients with adrenal disease Lawrence and Rowe[18] found that seventy-five percent had enlarged blind spots while twenty-five percent had "yellow discs".

Technique of eye studies

The peripheral fields for white were outlined on the Ferree-Rand perimeter at a 330-mm. distance with a target of 2 mm., using 7 foot-candles of light. The following twelve principal meridians were examined: 0, 30, 60, 90, 120, 150, 180, 210, 240, 270, 300, and 330. Blind spots and other scotomata were searched for, on the small Lloyd slate with a wide-angled stereoscope at 16.5 cm. with a 2 mm. target. Further search for scotomata was made on a Bjerrum screen at three meters with a 2-mm. target. The fundi were examined with the usual May electric ophthalmoscope and more recently the colors were compared with the Cohen[19] colorimeter. Doubtful or unsatisfactory examinations were repeated until absolute confirmation was obtained.

Detailed and minute descriptions of the cases in our series have not been included as a portion of this paper in order to save time and space, because the majority of the cases are of such an evident and characteristic nature that a detailed report is not necessary to prove the obvious diagnosis.

Our fifty cases include six cases of toxic goiter, with basal metabolic rates ranging from + thirty-five percent to

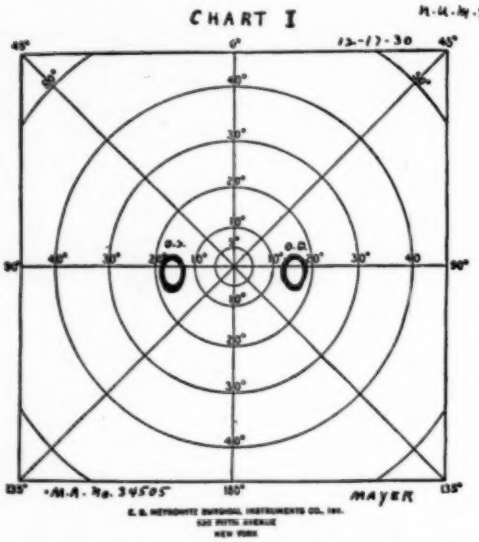

Fig. 1 (Mayer). Enlarged blind spots in a mentally defective girl, showing precocious puberty.

+ fifty-five percent; one case of idiopathic pituitary atrophy or Simmond's disease with all the typical signs and, in addition, diabetes insipidus; a case of congenital apituitarism, with dwarfism, sexual infantilism and deaf mutism; a case of idiopathic tetany; a case of myxedema; twelve cases of hypopituitarism in adolescence or in adult age, chiefly of the Froehlich type; eleven cases of hypo-ovarism due to artificial menopause; two cases of hyperpituitarism in adolescence with excessive growth and precocious puberty; and fifteen cases of developmental anomalies, such as spina bifida, elephantiasis gingivæ, infantilism, feeblemindedness, and constitutional obesity, with or without glandular disturbances.

In the entire series only one patient, M. A., had an enlarged blind spot. This was demonstrable on several occasions on this individual but may be easily explained when it is known that the patient was mentally defective, showing a precocious puberty and hypersexualism with excessive masturbation in a girl of 15 years. The blind spots are shown in figure 1.

Very marked concentric contractions of the peripheral fields for white were found in five cases. These cases may be divided into three groups. C. N. and M. McG. both had an excessively low sugar tolerance, gave a history of one parent having died of diabetes, and are therefore considered prediabetics. E. M. and E. W. both had artificial menopause with the usual accompanying vasco-motor disturbances. The former was also labeled an unstable individual. B. J. alone in the third group was a twenty-one-year-old girl, with hypomenorrhea, so-called premenstrual pituitary headaches with vomiting, an unstable nervous type, probably the result of a pituitary disease. Figure 2 shows the characteristic fields of these five, which will be readily recognized as the typical "hysterical" or tubular fields.

No further concentric contractions were found in our series; however, four patients showed a lagging of the scatter in their temporal fields. L. R. and L. S. of this group were diagnosed as having constitutional obesity, which means that obesity was not only a familial trait but also present since the early years of life, without demonstrable endocrine disturbance. The former had a four plus Wassermann blood reaction. In another of this group, A. M., the diagnosis was hypopituitarism while the fourth, A.F., had a four plus Wassermann blood reaction and the diagnosis was prediabetes with hypo-ovarism. Figure 3 shows the type of field defect found in this group. As has been shown by Ferree, Rand, and Monroe[20] these must be considered as borderline cases which do not vary from the average normal to a great extent. In no case of the entire series

were we able to make a diagnosis of yellow or waxy disc.

We wish to draw special attention to the fact that in those cases showing most evident and serious endocrine disease, no abnormal findings whatsoever were demonstrable. From this small series in which we impartially approached the subject of ocular findings in endocrine disease we must necessarily draw the following conclusions:

1. There are no characteristic changes in the visual fields for white in endocrine disturbances.

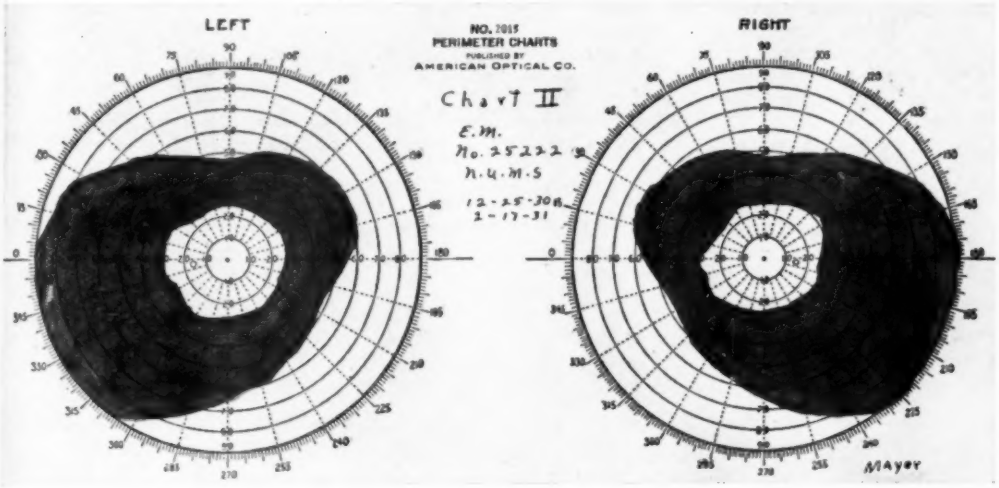

Fig. 2 (Mayer). Concentric contractions of the peripheral fields for white—the typical "hysterical" or tubular field.

2. There are no characteristic changes in the blind spots or scotomata in endocrine disease.

3. Changes in the color or nature of the optic disc were not noted in this series of endocrine disorders.

Northwestern University medical school.

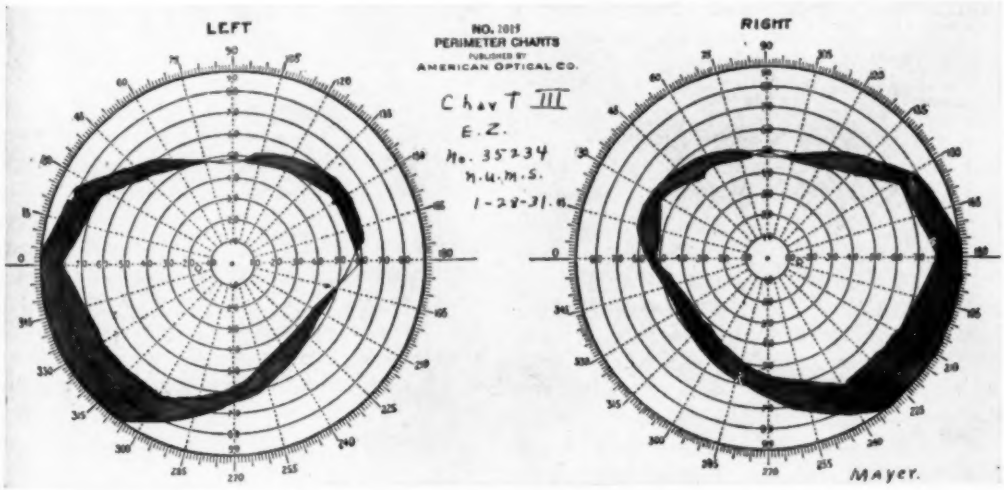

Fig. 3 (Mayer). Typical field defect in patients showing a lagging of the scatter in their temporal fields.

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CONTACT GLASSES IN KERATOCONUS AND IN AMETROPIA

Report of Cases

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The comparable values of the Zeiss and Müller contact glasses are discussed. Six cases of keratoconus and one of high myopia are reported in which treatment was with Müller contact glasses. Five keratoconus patients wore these glasses with comfort from ten to fourteen hours daily and had normal vision in both eyes. In a few patients some disturbance of the glands of internal secretion was observed. Read at the Lighthouse Eye Clinic, October 16, 1931, during the Clinical Congress of the American College of Surgeons.

History of contact glasses

The history of contact glasses begins in 1827 when Herschel invented them. In 1879 Raehlman tried hyperbolic glasses, and in 1884 Angelucci made an attempt to use conical glasses for correction of keratoconus and ametropia (cited from Müller). Those glasses never were of practical value, because the patient could see with the glasses only when the visual axes of the corneal cone and of the apex of the glass coincided. The visual field was, therefore, extremely limited. The first contact glass was not made for optical purposes. F. Müller[21] stated that Saemisch, in 1887, sent to the Müller firm a patient suffering from keratitis e lagophtalmo, due to a defective cancerous lid. The firm made a contact glass for him to protect the cornea from further ulceration; he wore the glass for several years. In 1888 Fick[8] asked Abbe, the director of the Zeiss firm, to grind a glass for him that would have a corneal curve of 8 mm. and a scleral curvature rim of 12 mm. The firm sent him a few blown glasses instead, with which he conducted experiments. He made plaster-of-paris moulds of cadavers' eyes, according to the shape of which, contact glasses were blown. In the same year August Müller constructed a contact lens for his own high-myopic refraction, with which he improved his vision to 0.5. In 1892 Sulzer reported that he had obtained good vision with ground glasses in one case of high astigmatism and in two cases of keratoconus. None of those lenses was of lasting value because in a short time they produced a marked congestion of

the eye with erosions of the cornea. Thus the idea of contact glasses was abandoned for quite a few years.

In 1896, Lohnstein of Berlin, and in 1897, Siegrist[28] of Switzerland, invented the so-called "Hydrodiascope", consisting of a small chamber filled with normal saline solution, in contact with the eye ball through the palpebral fissure. It was held at the orbit with rubber bands. Irregular corneal refraction was eliminated and a good accommodation range could be maintained by changing a plano-convex glass of varying strength in front of the chamber. The Hydrodiascope often improved vision markedly and could be worn for days without discomfort. Its use was both complicated and disfiguring so that patients would consent to wear it only on very urgent occasions.

Zeiss and Müller glasses

Fick's and Sulzer's attempts led to the application of the two types of contact glasses in present use—the blown glasses made by the Müller firm in Wiesbaden and the ground glasses made by the Carl Zeiss Company of Jena. The Müller glasses have been used since 1909; the Zeiss glasses were first tried by Stock[30] in 1920. Both types have several features in common: They are in direct contact with the eyeball and follow all its movements, being held in place by capillary attraction and atmospheric pressure; they consist of a central transparent, optically effective crown covering the cornea, and of an optically inactive peripheral brim resting on the sclera. Their thickness at the center is from 0.3 to 0.5 mm. The total weight of the Zeiss glass is 0.5 grams, the Müller glass being a little heavier; thus they are easily carried by the eyeball in its movements around the center of rotation. Comfort in wearing them depends mostly upon the perfect fit of the scleral part. The effect of either contact glass is produced by the layer of fluid, composed partly of lacrimal secretion and partly of physiologic salt solution with which the glass is filled and which is almost isotonic with the tear fluid. This layer fills the space between the anterior surface of the cornea and the posterior surface of the glass. Since the refractive index of the fluid is approximately the same as that of the cornea (1.376), rays of light coming to an eye with a contact glass undergo no essential change in their course between the anterior surface of the glass and the posterior surface of the cornea. This is aided by means of the difference in the radii of the posterior and anterior surfaces of the glass. The fluid meniscus practically eliminates the action of the irregular cornea and renders it inoperative. Corneal astigmatism and distortion of the corneal images are automatically abolished. The fluid lens at the same time forms a protective layer between the glass and the cornea, preventing pressure of the glass upon the latter and consequent erosions.

Zeiss and Müller glasses differ in shape and in the process of their manufacture. The **Zeiss glass** is made of crown glass, which in sodium light has a refractive index of 1.516. It has ground surfaces based on accurate optical calculations, and represents a ground segment of a sphere, its corneal and scleral parts having the contour of the anterior two-fifths of the globe. The glass until recently was standardized to four precise corneal curvatures, the radii of which are 6.5, 7.1, 8.1 and 9.0 mm. The diameter of the corneal segment is 12 mm., and the height of the corneal segment or its depth varies with the various radii—3.0, 4.0, 4.5 and 5.0 mm., respectively. The scleral part is about 4.5 mm. wide and is divided from the corneal part by a narrow rim. The diameter of the scleral part is 20 mm., the radius of its curvature, 11.0, 12.0, and 13 mm.

The scleral part of the **Müller glass** resembles the normal sclera, both in color and in the blood-vessel design, and is, therefore, inconspicuous. The lower, supporting scleral flange, is about 7-8 mm. wide; the upper one, 4-5 mm. and the temporal part 10-12 mm. There is a gradual transition from the corneal into the scleral part. Being blown, the Müller glass cannot be made a perfect spherical surface. The combined refraction of its anterior and pos-

terior surfaces should be from 42 to 48 D., to correspond with the average refraction of the normal cornea. The total refraction of the glass can be computed from the posterior and anterior radii of the glass surfaces according to the formula of F. Müller[21].

Let:

D_0 be the total refraction of the glass

D_1 be the refraction of the anterior surface of the glass

D_2 be the refraction of the posterior surface of the glass

r_1 be the radius of the anterior surface of the glass

Fig. 1 (Sitchevska). A. Müller contact glass—posterior surface. B. Zeiss contact glass. C. Müller contact glass—anterior surface.

r_2 be the radius of the posterior surface of the glass

n_1 be the refraction index of the air, equal 1.0

n_2 be the refraction index of the glass, equal 1.512

n_3 be the refraction index of the cornea, equal 1.376

Then

$$D_1 = \frac{n_2 - n_1}{r_1}; \qquad D_2 = \frac{n_3 - n_2}{r_2}$$

And $$D_0 = D_1 + D_2$$

The radii, r_1 and r_2 can be determined by the Siegrist[20] method. This is done by means of a small glass holding an apparatus adjusted to the chin-rest of the ophthalmometer. For instance, if the radii are found to be $r_1 = 8.42$ mm; $r_2 = 7.65$ mm.; then

$$D_1 = \frac{1.512 - 1.0}{8.42} = 60.80;$$

$$D_2 = \frac{1.376 - 1.512}{7.65} = -17.78$$

and $D_0 = D_1 + D_2 = 60.80 - 17.78 = 43$ diopters.

The Müller glass is at a great disadvantage, when compared with the Zeiss, for it cannot be made optically correct. The glass itself is often astigmatic. Siegrist experimented in 1916 with Müller glasses and found that out of fifty-two, twenty-seven were of low astigmatism with oblique axes, twelve of these having a high grade of astigmatism. These glasses, therefore, must be selected empirically by trying out a large number, an arduous task for both physician and patient. When the glass breaks or the edges wear off, the same procedure must be repeated anew.

Numerous authors have reported that the Müller glasses are being worn with greater comfort and are of longer duration than the Zeiss. The cause of this is seen in the following:

1. The broad scleral part of the Müller glass being supported by the lower fornix, forms a supporting base for the corneal portion. Pressure, on the eyeball, if present, is comfortably distributed, as it is minimized in inverse proportion to the broad scleral area.

2. The gradual transition from corneal to scleral segment prevents pressure upon the limbus and ciliary vessels, hence there is no interference with nutrition.

3. The Müller glass is also more durable, less fragile; its smooth, enameled surface is both unirritating to the tissues and chemically unaffected by the lacrimal fluid (Sommer[29], Gill[9]). The ground glass, on the other hand, easily becomes roughened in grinding, which leads to irritation and congestion of the tissues (Clausen[3]). Lauber[19] reported on a patient who wore the same glass for six years.

4. The Müller glass does not fit so snugly, as a comparison of the rapidity with which fluorescein enters and leaves the space between the glass and cornea discloses.

An ideal combination would be the blown scleral part of the Müller glass and the ground, optical part of the Zeiss glass. Erggelet[7] tried the Müller and Zeiss glasses on his own eyes. He could wear the Zeiss from one-quarter to one hour only; the Müller glass he wore with comfort for many hours.

For this reason he asked the Zeiss firm to grind the corneal part of several Müller glasses but every glass broke. Müller ascribed this rather to the thinness and delicacy of the glass plate than to the quality of the glass. Believing that the alkaline fluid was injurious to the glass, Erggelet tried to use quartz instead, but this did not diminish the irritation. V. Hippel[16], also, sent Müller glasses (about 200 in number) to the Zeiss firm for grinding to a uniform curvature, with the same result. In 1930 Clausen[4] and V. Hippel attempted to use Zellon glass for Zeiss lenses, but the results were not much better. Lindner[20] believes that the glasses which give perfect comfort should be used and recommends the Müller in preference to the optically ideal Zeiss lens. Stock, who had a keratoconus himself, had perfect vision with the Zeiss glass. After wearing it for two to three hours, the eye would become so painful and irritated that he would have to remove the glass.

The Contact glasses are particularly well worn by keratoconus patients because of the diminution in sensitivity of the cornea. Szilly[31] and Weill[34] believe that these patients should never be operated upon unless the contact lenses prove absolutely useless. Contact lenses not only correct the vision of such patients, but also have a therapeutic value according to Clausen[3], Sheffels[28], Jaensch[18], and Quirin[23]. They act like an orthopedic bandage by making the apex firmer, thus preventing further bulging of the cornea and checking the progress of the disease. Von Hippel[15] noticed in one patient that the opacities of the cone were diminished after he had worn contact glasses for one year.

Csapody[2] obtained an exact mould of the anterior segment of the globe by using paraffin with a low melting point. A glass cylinder that separates the lids and fixes the eye ball, is filled with molten paraffin. Since paraffin loses its shape quickly, it is necessary to harden it on the eyeball by ice cold paraffinol. The temperature to which the anterior surface of the globe is raised by the molten paraffin is about 102° or 103°, but the cornea is not injured and stands it well. Thus an exact model of the cornea and the adjacent parts of the sclera can be obtained according to the given shape. Both Zeiss and Müller firms considered this method desirable for making a proper glass.

Contact glasses in ametropia

For the past three or four years there has been a tendency to use contact glasses in high errors of refraction. Its most ardent proponent is Professor Heine of Kiel. He is using the Zeiss trial set of 39 afocal test contact glasses, having corneal radii of curvature ranging from 5 to 11 mm., with a difference of 0.25-mm. graduation between each glass. As high an error as 15 diopters of hypermetropia or 20 diopters of myopia can be corrected with these glasses. The desirable contact glass can be found according to the axial refraction of the eye and the corneal curvature radii, as given in graphical curves by Heine. If complete refraction cannot be obtained with an afocal glass, the remaining defect should be determined by subjective or objective methods. The Zeiss firm grinds the afocal glass with the requisite additional power of from one to twelve diopters, both concave and convex glasses. The problem is to select a glass, by means of which the posterior focus of the contact lens, fluid meniscus and ametropic eye is at the fovea centralis, or, in other words, the posterior focus is shifted forward for hypermetropic eyes and backward for myopic eyes (Rugg-Gunn[24]).

The physiological effect of the contact glasses in ametropia is the correction of muscle insufficiencies, both of convergence and divergence (Heine[12]). They enlarge the visual field which is important for certain professions such as architecture. The accommodation can easily be corrected with convex lenses. Heine[14] stresses the importance of correcting low degrees of myopia in children in order to prevent the development of high myopia later. The psychological effect of the contact glass is of some importance in that it improves the appearance of the patients, espe-

cially valuable to those on the stage or platform. Deutsch[6] tried to correct irregular astigmatism caused by deep and superficial maculae of the cornea with contact glasses; forty-nine patients, or sixty-seven eyes, were treated by the Zeiss glasses. The best results were obtained with patients whose scars were not dense or numerous; twelve cases of scars after deep keratitis showed no improvement. The accommodation was weakened and, in the majority of cases, a convex lens of two or three diopters had to be added for reading. All patients had good binocular vision with the glasses, and most of them stated that they were greatly relieved from the dizziness they experienced when wearing high spheres or high sphero-cylinders. The majority of them could wear the glasses only two to three hours during the day. The vision in ten patients was improved to 6/8, in eleven to 6/9, and in five to 6/6. Lindner's method of filling the glass with liquid while the glass was on the eye ball was often used. Hartinger[10], in his experience with the Zeiss glasses for correction of ametropia, states that in myopic patients the retinal image is magnified in some cases up to 50 percent; that of the hypermetropic is much less influenced. Wissman[35] used Müller glasses on a large number of ametropic individuals who could wear them with comfort from twelve to fourteen hours daily.

Aside from keratoconus and ametropia, there are other indications for the use of contact glasses. They can be worn as a protective bandage in cases of entropion and trichiasis, in keratitis e lagophtalmo, neuro-paralytic keratitis, and keratocele. Proksch[22] had good results with contact glasses in a case of descemetocele, in leucoma, and in protruding degenerations of the cornea. Professor Heine[13] advocates the use of the contact glass in various conditions of the eye, including diseases of the choroid and the retina. He also sees new indications for the contact glass in coloring its optical part to a light absorption value of 25, 50, and 75 percent. The 25 percent is for women on the stage who are willing to undergo the discomfort for the sake of a better appearance. The 50 and 75 percent light-absorption value in the glass would be useful for sportsmen and workers to protect them from snow blindness, excessive light and heat so that no colored glasses need to be worn. The eyes of various workers in chemical industries can be protected by the use of contact glasses, from chemical burns and fumes. Heine[11] believes the contact glass is the best treatment for color blindness and its photophobia, as it improves vision and reduces nystagmus.

Asher[1] suggested making a contact glass for albinos with a small colorless central part and a colored iris-shaped ring, brown or blue according to the color of the albino's iris. In extreme cases of photophobia the central part could also be colored. The glass should have the least curvature in order not to bring new anomalies of refraction. It would correct the ametropia and protect the eye from excessive light and photophobia; it would also eliminate the operation of coloring the lids of albinos.

The fitting of the contact glass

The fitting of the glass is simple. My patients learned to insert and remove it on the first visit, without any devices and without having the cornea anesthetized. The glass, with the concave surface up, is filled with warm normal saline solution and is held between the thumb and index fingers. The patient looks down as much as possible (in order not to hurt the cornea), lifts the upper lid with his other hand and inserts the upper edge; then he pulls the lower lid downward, looks up, and inserts the lower edge. The removal of the glass is more difficult for some patients. The patients looks up, then with his finger nail he lifts the lower edge of the glass and pushes it out with the motion of the eye ball. A glass or ivory spatula is useful for its removal. Often troublesome air bubbles come in between the contact lens and the cornea. Sometimes this occurs when the glass has too great a curvature, or when the patient does not insert it quickly

enough. In order to release the air bubble, it is sufficient to lift one edge of the glass; at times the air bubble disappears by itself moving toward the limbus; again it is necessary to take the glass out. The slitlamp is used to make sure that there is no direct contact between the lens and the cornea. Gradle and von der Heydt[17] advise using fluorescein for better observation of the beam of the slitlamp. I found that good focal illumination and a loupe are sufficient for controlling the zone of contact of the scleral part.

Report of Cases*

Case 1. The examination of the eyes of this thirty-year-old man revealed a typical keratoconus of both eyes, the cornea bulging more in the left eye. The ophthalmometer and Placido's keratoscope showed very small corneal reflex images, which were greatly distorted. The slitlamp examination showed striated and streaked opacities of the cones, especially at the apices, situated under the epithelium and in the deep layers of the parenchyma. Some of those striae were zigzagged and branching, forming a lattice work. In the middle layers of the parenchyma were grayish vertical lines situated deeper than the previous ones (Vogt's keratoconus lines). The nerve fiber design stood out markedly; no rupture of Descemet's membrane was seen; Fleisher's keratoconus ring was present. It was of a greenish color, arrow shaped, and more marked in the left eye. Sensitivity of the cones, particularly of the apices, was diminished.

Vision of the right eye was 10/200; that of the left, 6/200. High spherocylinders improved the vision but slightly. The general examination was negative. An x-ray of the cranial bones showed no rarefaction; blood count, blood chemistry, including blood calcium, were normal. Basal metabolism taken on two occasions gave reading within normal limits. The Abderhalden dialysis test done in Halle, Germany, however, showed a hypofunction of both the thyroid and thymus glands. The blood-coagulation time was diminished. Skin examination showed dryness, and the finger nails were brittle.

The patient was taken to Professor Clausen's clinic at Halle, Germany, in September 1929. There, of approximately 100 Müller contact glasses, the patient chose three pairs which he could wear comfortably. He also tried the Zeiss glasses, but could not wear them. The vision of the right eye with the Müller glass is 20/20; that of the left eye 20/30, without any other correction. He has been wearing them for two and a half years, from eight to ten hours daily. Occasionally the eyes become irritated; therefore he wears one glass at a time. This allows him almost the constant use of one eye. No diplopia is observed.

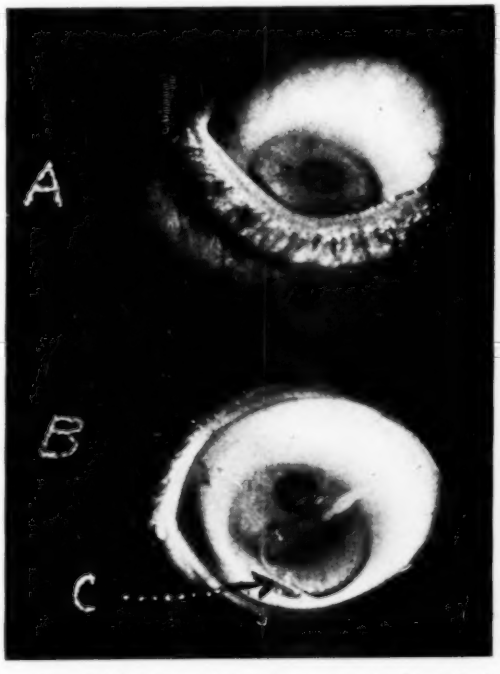

Fig. 2 (Sitchevska). Photograph of conical cornea (Case 1). A. Eye without contact glass. B. Eye with Müller contact glass. C. Air bubble between glass and cornea.

Recently the right eye became rather sensitive, so that the patient is wearing the contact glass mostly on the left eye. The opacity at the apex of the left eye has diminished in density,

* For full report of this case see Arch. of Ophth., April, 1931, v. 5, p. 672.

and the vision of that eye is 20/20 without any correction.

Case 2. The eye examination of this thirty-year-old man showed a low degree of bulging of the cornea. Upon slitlamp examination, faint opacities in the anterior layers of the parenchyma could be observed in both eyes. Refraction was: O.D. + 4.00 D.sph. ⌯ —8.50 cyl. ax. 78°. O.S. +4.00 D.sph. ⌯ —8.50 cyl. ax. 108°.

The corneal nerves were visible in the left eye. The ophthalmometer showed diminished and only slightly distorted images. The patient tried both Müller and Zeiss glasses. He had perfect vision with the Zeiss glass, which had the radius of corneal curvature 8.1 mm., and the radius of the scleral curvature 12 mm., but he could wear them from one to two hours only. He obtained three Müller glasses for the right eye and two for the left eye, with which the vision of his right eye was improved to 20/15, and to 20/20 in the left eye. He reads Jaeger type 1 with + 0.50 cyl. ax. 50° for the right and + 0.75 cyl. ax. 35° for the left eye. He has been wearing these glasses, usually in both eyes simultaneously, from twelve to fourteen hours daily since June, 1931. He is using his eyes extensively, as he teaches anatomy and embryology in a southern university.

Case 3. The patient, Miss T. M., 21 years of age, dressmaker, single, was seen in September, 1931. Chief complaint—failing vision in both eyes for the past three years. Glasses prescribed several times by optometrists improved her vision but slightly. Six months ago she was referred by Dr. Lambert to the Zeiss firm, where she was fitted with a contact glass for the right eye. She tried to wear it daily for a month, but could do so only for a half to one hour, after which she was "in agony", as the eye would become extremely painful. Her general health is good, though the hair has been falling out for the past few months and the skin is dry.

On examination the eyes showed a typical keratoconus O.U. When viewed from in front, both corneæ had the sparking appearance or the "dew drop" formation in the apices. There were opacities present in the superficial and deep layers of the cornea, more marked in the left cornea. Vertical, parallel, gray lines were seen in the left cornea in the deep layers of the substantia propria. No Fleisher's ring could be observed in either eye. Sensitivity of both corneæ at the apex was greatly diminished. Vision O.D. = 20/100; O.S. = 20/200. All laboratory tests were negative, except a slight increase in the lymphocyte count—35 per cent. The patient tried about 20 Müller glasses, out of which she obtained one glass for the right eye. Vision with the contact glass was 20/20. She reads Jaeger type 1. The slitlamp examination showed a perfect fitting of the scleral part of the glass. The patient refused to obtain a glass for the left eye for financial reasons. She has been wearing the right contact glass for six months, from six to nine hours daily, without discomfort. The patient broke the glass while carrying it in her purse without a box. She obtained another Müller glass from my collection, which improved the vision of the right eye to 20/30+.

Case 4. The patient, Mrs. E. E., aged thirty years, a Spanish Jewess, was referred to me from the New York Eye and Ear Infirmary in September 1931. Her chief complaint was a gradual impairment of vision since the age of puberty.

Examination of the eyes revealed a bilateral keratoconus with the "dew drop" formation. The left cornea was bulging more than the right. The opacities of the apices were marked, both in the superficial and deep layers of the cornea. On the left cornea a macula in the upper temporal quadrant was seen. Vision O.D. = 18/200; O.S. = 4/200. The only abnormality of the laboratory data was a marked lymphocytosis—52 percent. This patient had tried both Zeiss and Müller glasses for three months. Her vision could be improved to 20/70 in the right eye and to 20/200 in the left eye. She could endure the Müller glasses for only one or two hours at a time, as everything would then become foggy.

She could not read with any of those glasses, a +4.00 D. convex glass making it a little clearer. No contact glass, therefore, was given to her.

Case 5. The patient, Mr. C. C., aged twenty-seven years, was seen in July, 1931. He complained of poor vision in the left eye and slightly blurred vision in the right eye when at work. The vision of the left eye gradually became poor during the last four years. During the past two years his glasses were changed several times, but only the vision of the right eye could be improved by them.

The physical examination revealed nothing pathological, except an evidence of baldness and excessive perspiration. The blood examination, basal metabolism, x-ray of the skull and sinuses were within normal limits. The eyes, on examination, revealed an incipient keratoconus of the right eye and an advanced keratoconus of the left eye. The ophthalmometer showed 3 D. of astigmatism against the rule, and normal corneal reflex images in the right eye. The corneal reflex images were small and distorted in the left eye. Vision O.D. = 20/50; with —2.50 cyl. ax. 90° = 20/40. Vision O.S. = 16/200; with —1.75 D.sph. ⊂⊃ +3.00 cyl. ax. 155° = 20/100.

The patient tried about forty-five Müller contact glasses for the right eye and from twenty to thirty glasses for the left eye. He obtained two glasses for the right eye, with which the vision was improved to 20/20, a +1.00 cyl. ax. 180°, making it clearer. For the left eye he chose one glass, the vision being improved to 20/30, with no other correction. He could read Jaeger type 1 with either eye. He has been using these glasses alternately since October 1931, wearing the contact glass in the right eye from ten to twelve hours a day, and the left one from four to five hours every other day. To date he has experienced no pain or discomfort.

Case 6. The patient, Miss C. S., aged thirty-five years, secretary, was seen at the Lighthouse Clinic in March, 1931. She complained of blurred vision in both eyes for the past five years and inability to read without the aid of a magnifying glass. She had the usual childhood diseases, felt well at present, but was extremely nervous. The patient has been wearing glasses since she was thirteen years of age. From then on the eye specialist who treated her was unable to improve the vision of the left eye. Five years ago she noticed the vision of her right eye becoming blurred. Two years ago an ophthalmologist diagnosed her case as "conical cornea". He referred her to the Zeiss firm, where contact glasses were tried on her. She could not see well with these glasses, and her eyes became inflamed and painful whenever she put them in.

The patient had been examined thoroughly at the Lighthouse Clinic Laboratory; her hemoglobin was only 67 percent, there was an increase of lymphocytes—49 per cent, and the blood-coagulation time was three minutes. Keratoconus of both eyes was diagnosed on examination. Fleisher's ring was observed with the slitlamp in the left eye. Vision O.D. = —20/200; vision O.S. = —16/200; no improvement by glasses.

Out of approximately thirty-five Müller contact glasses, the patient selected two for the right eye. The vision of this eye was improved to 20/15 with those glasses. The right corneal reflex images were normal when examined with the ophthalmometer while she was wearing the contact glass. In July, 1931, she obtained a contact glass for the left eye, which improved the vision to 20/30, with no other correction. The patient has been wearing Müller contact glasses for nearly one year from eight to nine hours daily, one glass at a time on either eye, thus allowing the other to rest every other day. She resumed her work, which requires constant use of the eyes, and experienced no difficulties. Bright light irritated the eyes occasionally, and I advised her to wear smoked glasses on sunny days.

The following sentiment was expressed by the patient in one of her letters:

"Having lived in a world of gray fog and distortion for a period of five years,

I felt as if I had entered a new world when I put the contact glasses in. . . . Imagine being able to see objects and people as they really exist, without distortion. Too overwhelming to be true."

Case 7. The patient, Mr. A. H., thirty-four years of age, was referred to me by Dr. Smith as a high-myopia case for correction with contact glasses. Since childhood he had been wearing glasses which had to be increased in strength nearly every year. None of the members of his immediate family was near-sighted.

On examination, both eyeballs appeared to be slightly bulging. The media O.U. revealed floating vitreous opacities. The fundi presented typical myopic changes; large conuses on the temporal side of the discs, also many atrophic patches of the choroid at and about the macular region, more marked in the right eye. Vision O.D. = 4/200, with —23 D. sph. = 18/200. Vision O.S. = 6/200, with —21 D. sph. = 20/200.

Skiascopy showed —25 D. in the right eye and —23 D. in the left eye. The patient chose one Müller contact glass for each eye. The vision of the right eye was improved to 20/70 with the contact glass, that of the left eye to 20/50, with +1.50 D. sph. = 20/40—. He accepts for reading +3 D. sph., and reads Jaeger type 2.

The patient has been wearing both glasses simultaneously for the past three months from six to eight hours daily. He states that objects and people are seen slightly exaggerated.

Table 1

IMPROVEMENT OF VISION AND LENGTH OF TIME THE CONTACT GLASSES WERE WORN

Patient	Diagnosis	Vision uncorrected		Vision corrected by contact glasses		Length of time in months
		O.D.	O.S.	O.D.	O.S.	
1.	Keratoconus	10/200	6/200	20/20	20/30	30
2.	Keratoconus	20/70	20/50	20/15	20/20	12
3.	Keratoconus	20/100	20/200	20/30	No glass	6
4.	Keratoconus	18/200	4/200	20/70	No glass prescribed	
5.	Keratoconus	20/50	16/200	20/20	20/30	5
6.	Keratoconus	20/200	16/200	20/20	20/30	12
7.	High Myopia	4/200	6/200	20/70	20/50	3

The basal metabolism test was within normal limits in all patients; the Abderhalden dialysis test (which is very accurate) showed hypofunction of both the thymus and the thyroid glands in one patient.

Since Török[32] and Redway reported faulty calcium metabolism in three patients, I had mine examined for this condition. The blood calcium was normal, and none of the patients showed rarefaction of the cranial bones on roentgenologic examination.

My patients showed no disturbance of the sympathetic nervous system. The pupils were normal in size, and no increase in the dilatation time by cocain was observed in one patient; two patients were of a nervous disposition. An increase of lymphocytes was recorded in three patients, and four showed an acceleration of the blood-coagulation time.

Summary

Three female and three male keratoconus patients, aged from twenty-one to thirty-five years, were carefully studied for a clue as to the etiology of this affection of the cornea. Most of the patients suffered from a symptom-complex known as hypothyroidism, which was first pointed out by Siegrist[25]. The trophic disturbance manifested itself in falling of the hair, brittleness of the nails, and dryness of the skin in four patients; hypertrychosis

solution was observed (in contradiction to Verderame's[33] observation). The only steady sign I found in my patients was the diminution in sensitivity at the apex of the cone.

One high myopia and six keratoconus patients were treated using Müller contact glasses. On five of these patients the Zeiss glasses were tried without success. In two patients the visual acuity was improved from counting fingers at one meter to 20/20, and from 20/200 to 20/20 in three patients. The therapeutic effect of the contact glass is well demonstrated on one patient (Case 1), who has been wearing the Müller glass on the left eye several hours daily for the past two and one-half years. The opacity of the apex of that eye has diminished in density and the vision of the same eye was improved from 20/30 to 20/20. The vision of one keratoconus patient could not be improved either with the Müller or with the Zeiss glass. The high myopia patient with fundi lesions showed a remarkable improvement with the contact glasses as compared with the ordinary lenses. The Müller contact glasses were preferred to the Zeiss by the patients, as they found them to be more comfortable. The decomposing influence of the lacrimal fluid upon the Müller glasses was observed on a few worn from one to two years as in Cases 1 and 2. The edges became sharp and their use had to be discontinued.

Conclusions

At present contact glasses are the best means of treating the unfortunate victims afflicted with conical cornea at the prime of life. Surgical interference should be undertaken only as a last resort. All the disadvantages in selecting and in wearing these glasses can be disregarded when one considers their incalculable physiological and psychological value. My experience with contact lenses for correction of ametropia is too brief to draw any conclusions. It seems, however, that in the future contact glasses may become an important factor in aiding the sight-conservation problem.

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THE EFFECT OF X-RAY AND RADIUM RADIATIONS UPON THE CRYSTALLINE LENS

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The author has collected a group of thirty-four cases from the literature since 1903, in which lenticular changes have resulted from the use of x-ray or radium therapy for various pathological ocular conditions. He comes to the conclusion that the use of this therapy should be limited to the more serious eye conditions. Read before the Ophthalmological Section of the Baltimore City Medical Society, March, 1932. From the Wilmer Institute of the Johns Hopkins Medical School.

Roentgen cataract. In recent years the use of the x-ray has been advocated in the treatment of interstitial keratitis as well as of malignant conditions. Radium has been used for some time in the treatment of malignant diseases, vernal conjunctivitis, and cataract, and more recently it has been advocated for many other conditions about the eye. In view of this increased use of both the x-ray and radium, a review of the action of these agents seems advisable.

In 1895 Roentgen discovered the x-ray and two years later Chalupecky[1] demonstrated that irradiated rabbits developed anterior-polar lenticular opacities fifty days after exposure. Other experimental work has been done upon eyes by Scholtz[2], Birch-Hirschfeld[3], von Hippel[4], Bousset[5], Rauch[6], Pagenstecher[7], Radoz and Schinz[8], Jacoby[9], Rohrschneider[10], Peters[11], Politzer[12], Auluano[13], Goldman[14], Nordmann[15], and others.

Radoz and Schinz[8] concluded from their investigations that the rays would frequently produce conjunctivitis, keratitis, and loss of the lashes, but seldom caused lenticular changes. These results, however, are at variance with those of most other investigations.

Peters's[11] experiments showed that slight clouding of the posterior pole developed after exposure to moderate-sized doses of x-ray and complete cataract developed after exposure to large doses. He filtered the rays through various metals and varied the doses from 1 to 10 HED. The shortest latent period that he experienced after using 1 to 2.5 HED was 165 days and the longest 325 days. After high doses (4 HED or fractional doses) total cataract developed in from one to two months.

Figure 1 shows the appearance of the posterior part of the lens of one of his rabbits, 577 days after exposure to 1 HED with 3 mm. Al. filter. The clouding at the posterior pole is easily seen.

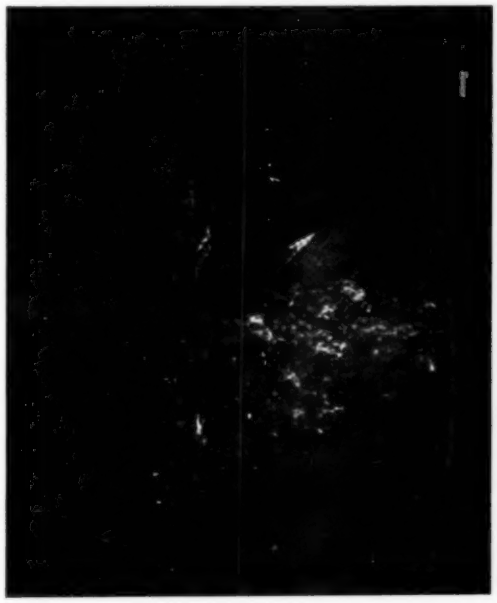

Fig. 1 (Clapp). Posterior polar cataract 577 days after exposure to x-rays (Peters).*

Figure 2 shows the same area under the microscope. The vacuoles are seen to be rather numerous with some granular degeneration.

Auluano[13] has confirmed Peters's[11] findings and found in some cases that the dose was so small that no local reaction occurred but that a lenticular

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opacity developed months later. He showed that both the hard and the soft rays would produce these opacities but that the soft rays had a slightly greater tendency to do this than the hard ones. In his work the shortest latent period was three months, and the longest eight months. Nordmann[15] states that the

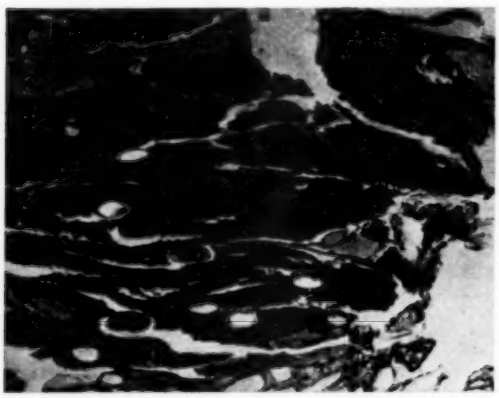

Fig. 2 (Clapp). Vacuoles in posterior cortical layers of area shown in figure 1 (Peters).

lenticular opacities may occur when the rays are applied through the bones of the head without direct application to the eye.

Desjardins[16] believes that young animals show much greater susceptibility to lens changes after irradiation than do adult animals. He also states that the degenerative changes first affect the anterior epithelium, and later there is a development of vacuoles and granular material in the deeper lens substance. The capsule also becomes thicker.

The clinical cases I have grouped and shown in table 1.

While Gutman's[17] case in 1903 is the first clinical case recorded, Leslie Paton's[18] report in 1908 is apparently the first recorded case in the English literature. This case was the result of the use of the x-ray for lupus of the lids.

Another clinical report to which I wish to call your attention is that of Stock[19] who reported three cases of premature delivery caused by the x-ray. The lenses of each fetus showed cortical clouding.

Foster Moore[20] has recently (1931) reported a case of x-ray cataract. This case occurred in a young man twenty-eight years of age who had a severe sycosis of the scalp, face, and neck. Irradiation was given from February to June, 1927, a total of 12 Sabouraud doses in five months. The sycosis was cured. Telangiectases occurred in October, 1929. In November, 1929, sight began to fail but on March 19, 1930, his vision was 6/12 in each eye. In June, 1930, his vision was 6/60 in each eye and his lenses showed a plaquelike opacity in the posterior cortical region with fine opacities extending to the periphery. Moore also states that many of the earlier x-ray operators who failed to use proper filters developed early lenticular opacities.

Radium cataract. The reports of clinical cases of cataract resulting from radium radiations are less numerous than those resulting from x-ray treatment.

In a personal communication, Dr. Curtis Burnam of the Johns Hopkins

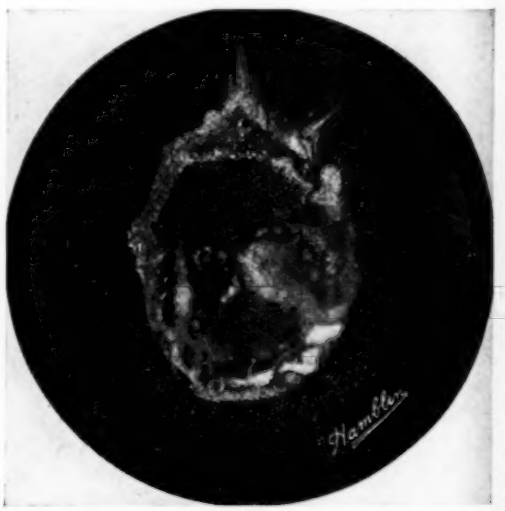

Fig. 3 (Clapp). Showing the opacity in the posterior cortex of the lens (Moore).

Hospital, states that he has seen it occur in his early work, when a malignant condition of the eye or the lids was being treated, and Dr. W. B. Doherty, of the New York Eye and Ear Infirmary has made a similar statement.

In the past year Blegvad[21] has reported four cases of cataract following

Table 1

NAME	DATE	DISEASES TREATED	LENS CHANGES	REMARKS
Gutman	1903	Constructor of x-ray tubes	Vacuoles in posterior cortical regions, both lenses	
Treutler	1905	X-ray worker	Bilateral posterior polar cataracts	
Birch-Hirschfeld	1908	Epithelioma of lid	Clouding of posterior cortical layer	2½ years after treatment
Birch-Hirschfeld	1923	Sarcoma of choroid	Subcapsular and post-cortical opacities	80 HED x-ray, 100 mg. Rad. 10 hr.
Paton	1909	Lupus of lids, 32 year-old woman	Thick gray-white opacity in posterior layers	6 years after treatment
Stock	1911	X-ray of pregnant mother	Cortical clouding, 3 fetus eyes	Premature delivery
Axenfeld	1916	Glioma of retina	Total cataract	Possibly secondary
Kusama	1919	Glioma of retina	Lens calcified, 3 children	Both radium and x-ray treatment
Wilkinson	1920	Lupus erythematosa	Position not noted, bilateral	60 exposures
Salzer	1921	Intraocular sarcoma	Posterior cortical opacities	9½ months after exposure
Horay	1922	Sycosis	Posterior cortical cataract	5 years after exposure
Horay	1926	Sycosis	Posterior cortical cataract	35 years old
Dor	1923	Spring catarrh	Double cataract	35 years after exposure
Pfahler	1924	Orbital sarcoma	Cataract	4 yrs. old, 6 yrs. after treatment
Ziegler	1924	Supra-orbital sarcoma	Cataract	
Ashcher	1925	Sclero-lymphoma	Central posterior cortical opacities	8 years after exposure
Salus	1925	In discussion, 3 cases	X-ray cataract	
Scheerer	1925		Posterior cortical cataract	3 years later
Scheerer	1926	Lupus	Posterior polar cataract, bilateral	
Stock	1928		Posterior cortical cataract	1½ years after 8 doses
Davids	1928	Sarcoma of choroid	Posterior cortical cataract	
Rohrschneider	1928	Fibroma of nose and throat	Posterior polar cataract	5 years after exposure
Meesman	1928	Fibroma of nose and throat	Posterior polar cataract	5 years after treatment

Table 1 (Continued)

Name	Date	Diseases treated	Lens changes	Remarks
Erggelet	1928	Roentgen tube worker	Anterior and posterior cortical cataract	
Jess	1928	Hypophyseal tumor	Posterior polar cataract	3½ years after exposure
Jess	1928	Nose and throat fibroma	Posterior polar cataract	3½ years after exposure
Vogt	1928	Sarcoma of limbus	Anterior and posterior subcapsular opacity	3 years after exposure
Meyer	1930	Epithelioma of lid		Rapidly formed
Meyer	1930	Epithelioma of lid		Radium used
Blegvad	1931	Four cases malignant disease	Posterior cortical opacities	No protection in 3 0.5 mm. lead in 1
de Schweinitz	1931	Epibulbar sarcoma	Disc-shaped opacity at posterior pole	0.5 Al. filter 3 years after treatment
de Schweinitz	1931	Epibulbar sarcoma	Anterior subcapsular opacities	1 yr. later 10 treatments
de Schweinitz	1931	Vernal catarrh		
Moore	1931	Sycosis	Posterior cortical opacities	12 Sabouraud doses 2½ yr. after treatment

the use of radium for malignant disease. In three of the cases no protection to the eye was given, while in the fourth case the ray was filtered through .5 mm. of lead. In those cases where 3 mm. of lead were used, no injury to the lens could be demonstrated. Recently de Schweinitz[22] has reported three cases as follows:

One: A man fifty years of age was treated for epibulbar sarcoma by radium with the use of .5 mm. of Al. as a filter. Two treatments were given and three years later a disc-shaped opacity was found at the posterior pole with fine opacities beneath the anterior capsule.

Two: A woman forty years of age, with melanotic epibulbar sarcoma, was given ten radium treatments, after which the growth disappeared. There were quite marked telangiectases of the vessels with anterior subcapsular lenticular opacities appearing one year later.

Three: A case of lenticular opacities developed after radium treatment had been given for a case of vernal catarrh.

Experimental investigation of the action of radium by Birch-Hirschfeld[3] showed corneal, retinal, and optic nerve changes but no demonstrable lens change. Peters[11], however, has found very definite lenticular changes following its use. Table 2 shows the amount of exposure that he gave, which varied from 160 to 640 mgh., as well as the latent period, which was found to be from 90 to 260 days.

It is certainly difficult to determine just how much the use of the x-ray or radium was responsible for the cataract in some of the clinical cases.

The cases of Horay[23] and Dor[24], in which the latent period was thirty-five years, are open to question and, to a lesser extent, the cases of Paton[18], Pfahler, Ashcher, de Schweinitz[22] and others where the latent period was five years or more.

As to the mechanism and production of the lenticular opacities following the use of either x-ray or radium, nothing very definite has been determined. It would seem, from the long latent period, that alteration in the capsular epithelium, with later disturbance in the nutrition of the lens fibers, is respons-

Table 2

EXPERIMENTAL RADIUM CHART (Peters)

Experiment	Dose	Lenticular changes	Latent period
Rabbit 1. Left eye.	160 mgh. with 0.5 mm. Pt.-Ir. filter.	(a) Fine posterior polar clouding. (b) Subcapsular vacuoles.	(a) 150 days. (b) 90 days.
Rabbit 2. Left eye.	320 mgh. with 0.5 mm. Pt.-Ir. filter.	(a) Fine posterior polar clouding. (b) Fine horizontal streaks with droplike clouding.	(a) 180 days. (b) 150 days.
Rabbit 3. Left eye.	480 mgh. with 0.5 mm. Pt.-Ir. filter.	(a) Posterior polar clouding. (b) Vacuoles under anterior capsule. Points of clouding in cortex.	(a) 260 days. (b) 90 days.
Rabbit 4. Left eye.	640 mgh. with 0.5 mm. Pt.-Ir. filter.	(a) Posterior polar clouding. (b) Many fine points of clouding in anterior cortical; vacuoles under anterior capsule.	(a) 260 days. (b) 90 days.

ible for the condition, or that such disturbance of nutrition has been brought about by damage of the endothelium of the capillaries in the ciliary processes.

While the use of both of these rays is undoubtedly indicated in certain malignant conditions and possibly in some infectious conditions such as sycosis, there is undoubtedly an element of danger connected with it. It would seem wise to limit the use of this form of treatment to the more serious eye conditions. Certainly it would not be justifiable to take the risk of producing a cataract in the course of treatment for some trivial condition. It is possible, as shown by Blegvad[21], that if a filter of 3 mm. of lead is used, no opacities will result. The radiologists may be able to solve the problem of the use of these therapeutic measures without any danger to the lens or deeper layers of the eye.

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FREQUENCY OF THE VARIOUS KINDS OF REFRACTIVE ERRORS

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A report on 10,153 cases examined during 1931 in the refraction department of the Wills Hospital, excluding aphakic cases and those in which no glasses were prescribed, shows a division of 66.4 percent of hyperopia and 17 percent of myopia, 68 percent of all patients being astigmatic. The use of a mydriatic is recommended for obtaining the best results in patients up to the age of 40 years.

A total of 11,743 patients was examined during 1931 in the refraction department at the Wills Hospital, in order to correct any existing ametropia and to determine the need of glasses. All patients who were under forty years of age were tested using cycloplegia from either one percent atropine, two percent homatropine or one-eighth percent scopolamine, except when the use of any drug was contraindicated. Cycloplegics were occasionally used between the ages of forty and forty-five years. As generally accepted by ophthalmologists, atropine was always found to be the most efficient cycloplegic and conducive to the most satisfactory refraction. It was used regularly in the younger patients and wherever possible in youth. In the others, homatropine gave satisfactory results and was considered more desirable than scopolamine for routine use. Where atropine was prescribed, the patients were directed to begin the use of the drops at least two days before the examination, so that by putting one drop in each eye three times a day, not less than five instillations would be given. In this way a satisfactory condition of a cycloplegia was ordinarily obtained and not a single patient who suffered from the ill effects of the drug was encountered.

In determining the kind and extent of the refractive error of the eyes of these patients, all approved and recognized methods were used. Retinoscopy was a routine procedure and was found to be almost indispensable. In young children below school age, accurate retinoscopy can be relied on practically exclusively for determining the nature and extent of the refractive error present. This examination was carried out almost entirely by the use of spherical lenses although in a small number of the cases cylinders were used with the same result. Free use was also made of the keratometer, cross cylinders and astigmatic dials in testing for astigmatism. In prescribing glasses, the nature of the patient's complaints, the question of whether or not glasses were previously worn and all the individual requirements of each case were carefully considered and the results recorded.

A search of the literature does not reveal any satisfactory reports on the analysis of a large enough group of cases to provide much information. In 1912, in the collected papers of the Mayo Clinic, G. B. Granger published an analysis of 13,000 cases examined for errors of refraction in the Mayo Clinic which were collected over a period of twenty-two years. This report gave a rather low percentage for the various types of errors recorded because they were based on a total of all cases examined, including a large number of aphakic cases and others for whom no glasses were prescribed but who were not otherwise classified. A more detailed analysis was not given.

The purpose of this paper is not to establish any definite rules of change of the refractive state in the same patients over a great many years, but to record in a larger number of patients of various age groups principally the incidence of some of the recognized forms of ametropia, the frequency of the average spherical correction in dioptric strength occurring in hyperopia and myopia, and also the relative frequency with which the various meridians of the eye were affected in astigmatism, both hyperopic and myopic, as shown by the axis of the correcting cylinder.

Of the total number of patients examined, there were 1,034 for whom no glasses were prescribed after refraction and 553 who were aphakic. These were nearly all postoperative cataract cases and are not included in the calculations. Of the remaining 10,153 cases, about 66.4 percent were hyperopic and about 17.0 percent were myopic. About 68 percent of all patients were astigmatic.

About 5.1 percent of the total number of patients were found to be emmetropic, in the sense that they revealed only 0.50 D., or less, error, and did not require glasses.

Antimetropia, which is here considered as applying to those cases which are definitely hyperopic in one eye and myopic in the other, averaged 1.4 percent of the total but these cases are included in the larger group of anisometropia, which total 8.4 percent. Ordinarily the term anisometropia is used to include those cases showing a great difference in the refraction of the two eyes, but for the purpose of classification and for teaching, the question often arises as to how much or how little difference in the refraction of the two eyes shall constitute a case of anisometropia. The textbooks define the condition simply as one in which the refractive state of the two eyes is different or not exactly the same. In this classification, anisometropia includes those cases in which the character of the refraction was different in the two eyes.

Mixed astigmatism occurred to the extent of 3.1 percent and is used to designate those eyes that were found to be hyperopic in one principal meridian and myopic in the opposite. This condition is certainly a refractive state of the eye that should be recorded as such, even though the extent of the error in the two meridians equalize each other.

Jackson in his tables stressed the necessity for taking the average of the principal meridians in all eyes in order to think clearly, as he puts it, about the relations of spherical and astigmatic refractions. When the average of the meridians of an eye resulted in 0.50 D. or less, of hyperopia or myopia, it was classified under the head of emmetropia. Cases of mixed astigmatism, therefore, in which the average of the two meridians resulted in 0.5 D. or less were included with the emmetropias. This was referred to by Jackson as "practical emmetropia" which from the standpoint of norms, is more useful than exact emmetropia, which, he states, is a theoretical condition rarely encountered.

Table 1 is therefore presented here, according to the method of Jackson, and shows in a selected group of 9170 cases, the number and percentage of hyperopic and myopic eyes; but those in which the refraction of the meridians averaged 0.50 D. or less are classed as such, rather than as cases of emmetropia. This latter group, of course, also includes many cases of mixed astigma-

tism and simple astigmatism, as well as those of exact emmetropia.

All unsatisfactory cases, where the vision was exceptionally poor or where the refractive state of the eye was influenced by other pathology, were excluded. Of course, the first group under five years, included nearly all the cases of strabismus which were brought for that reason. In only ten eyes or 1.2 percent of this group did the average spherical refraction result in 0.50 diopter or less. Ninety-eight and eight-tenths percent were hyperopic eyes while in 1 percent of the group (eight eyes) the correction was myopic. In each succeeding age group up to the age of thirty years, it is apparent that hyperopia decreased while myopia increased in the percentage of the total. In the 20-to-30 year group, the percentage of hyperopia was found to have decreased to 63.0 percent while that of myopia had increased to 22.0 percent. The percentage of myopia was found to be greater among the children of school age. In the groups from 40 years to 50 years and 50 years to 60 years, those whose average spherical refraction resulted in 0.50 D. or less, ran rather high but this is because many presbyopes who were found to be emmetropic for distance were here included. In these age groups about two-thirds of the remaining eyes were hyperopic whereas about one-sixth were myopic. At the age of 60 years, both hyperopia and myopia showed increases, which is in accord with the general feeling that this occurs due to pronounced changes in the crystalline lens.

Hyperopia. Figures 1 and 2 show graphically an analysis of the 12,946 eyes that were hyperopic. These are also arranged in age groups, so that they reveal at a glance the frequency of occurrence of the various diopters of average spherical hyperopia encountered in each age group and a comparison of the different groups. In those patients under five years of age, for example, there were included 794 eyes. None showed less than one diopter of hyperopia. Those that averaged from one to two diopters numbered 10 percent of the total. Two to three diopters were found in 20.6 percent, while between three and four diopters were found in 20.3 percent. The percentage of those having a higher hyperopia gradually declined to 10.8 percent for those showing a hyperopia of six to seven diopters, after which the curve gradually declines to 0.5 percent for those having a hyperopia of nine diopters. In the second group between the ages of five and ten years, the percentage of those with a hyperopia of one to two diopters increases to 25.4 This continues in the older cases with a corresponding decrease in the percentage of those with higher hyperopia, so that in the group from 20 to 30 years of age, 46.3 percent of the 1736 eyes had an average spherical hyperopia be-

Table 1

SPHERICAL REFRACTION IN 18,340 EYES

		0.50 D. or Less		Hyperopic		Myopic	
Age Group	No. Cases	No. Eyes	Pct.	No. Eyes	Pct.	No. Eyes	Pct.
Under 5 years	406	10	1.2	794	97.8	8	1.0
5 to 10 years	855	74	4.3	1488	87.1	148	8.6
10 to 15 years	1031	210	10.1	1449	70.4	403	19.5
15 to 20 years	853	206	12.1	1079	63.2	421	24.7
20 to 30 years	1378	414	15.0	1736	63.0	606	22.0
30 to 40 years	1404	373	13.4	1996	71.0	439	15.6
40 to 50 years	1538	549	17.9	2081	67.7	446	14.4
50 to 60 years	988	336	17.1	1317	66.6	323	16.3
60 to 70 years	552	130	11.8	775	70.2	199	18.0
Over 70 years	165	30	9.1	231	70.0	69	20.9
Total	9170	2332		12,946		3062	

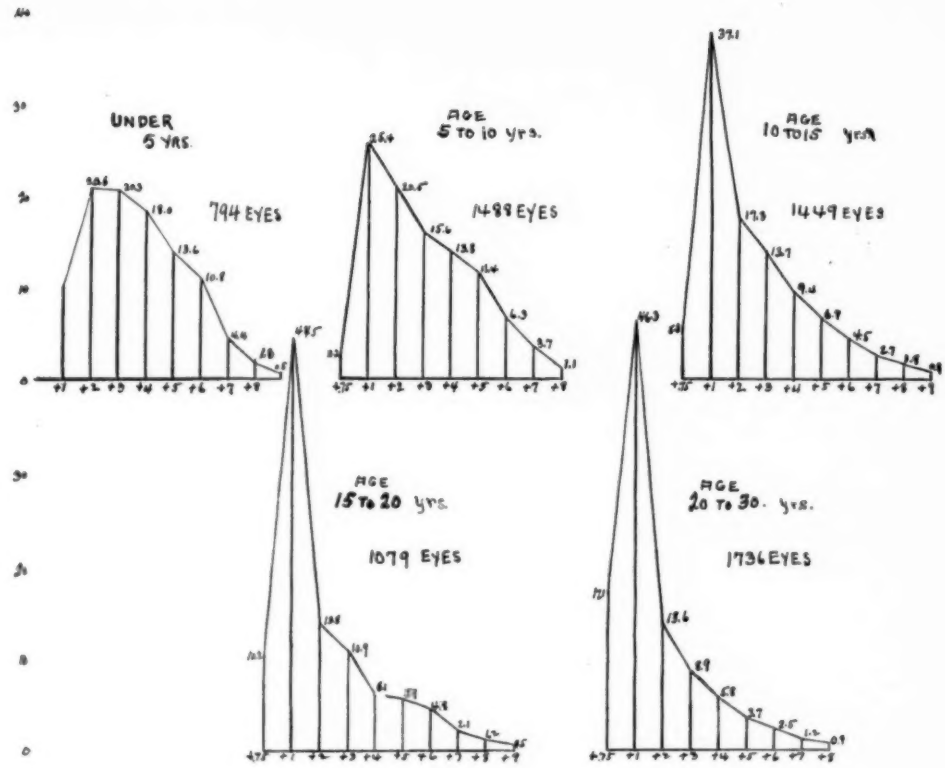

Fig. 1

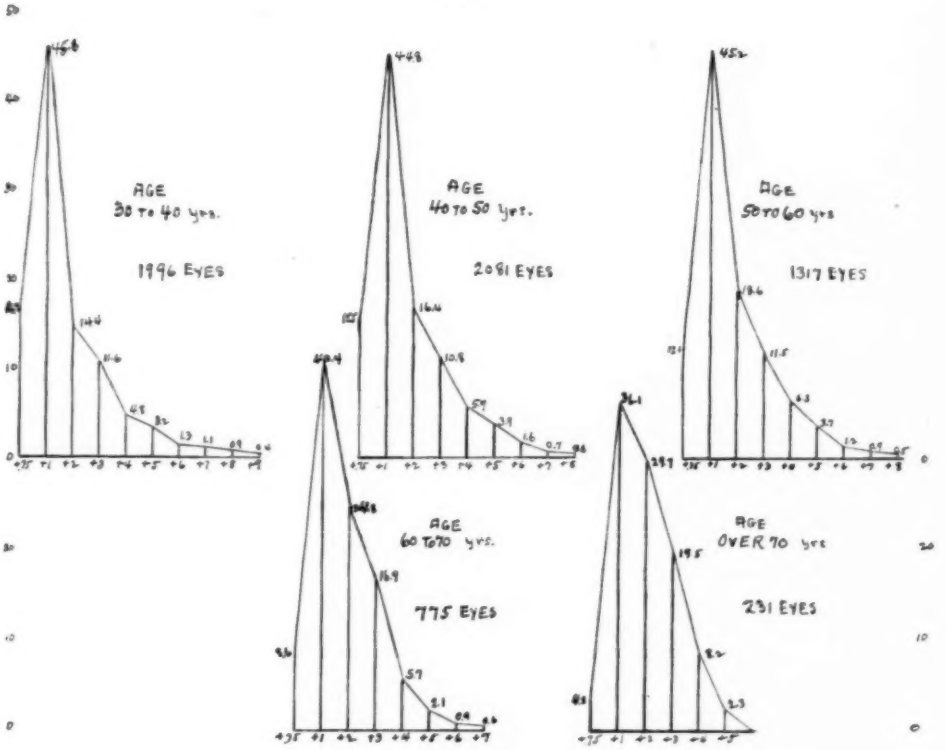

Fig. 2

Figs. 1 and 2 (Tassman). Spherical refraction in hyperopia. Ordinates indicate diopters; abscissas indicate percentage of total number of cases.

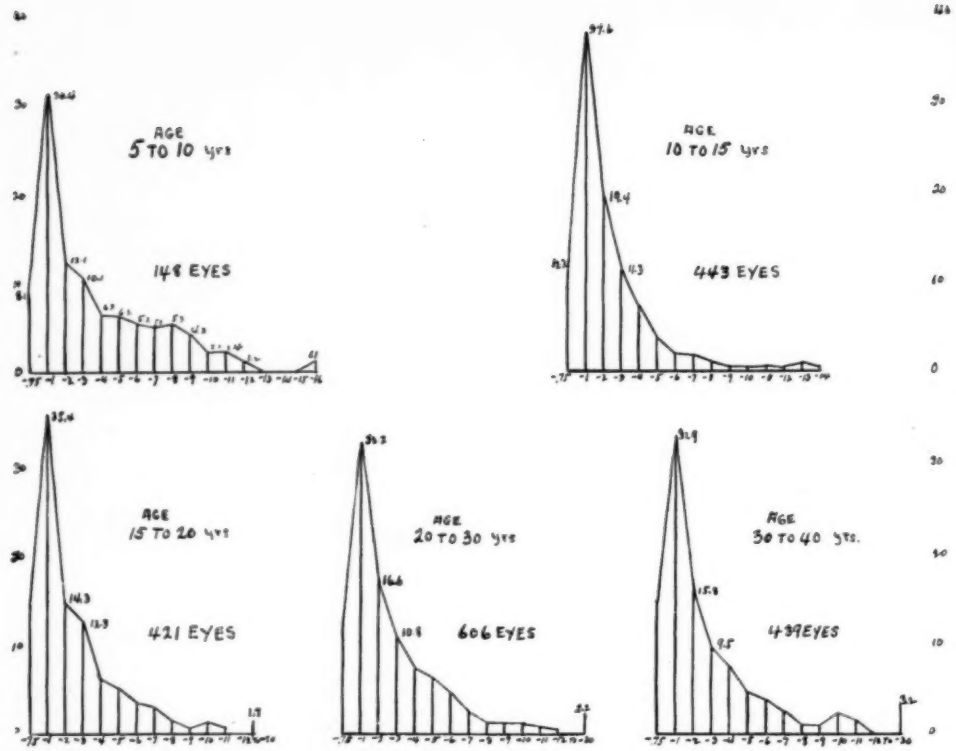

Fig. 3

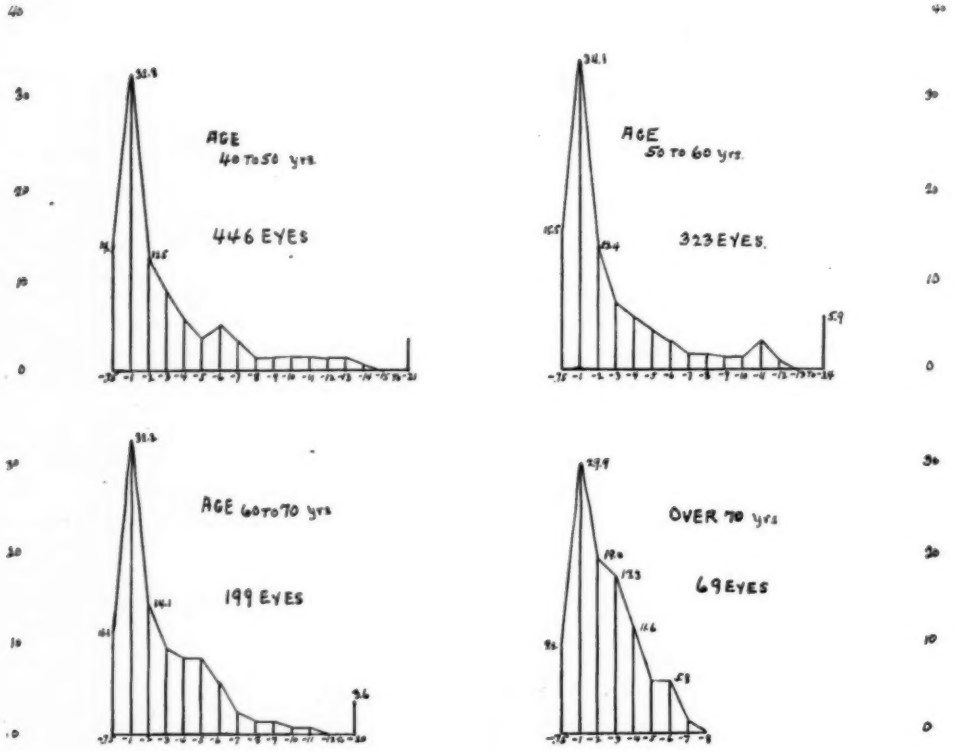

Fig. 4

Figs. 3 and 4 (Tassman). Spherical refraction in myopia. Ordinates indicate diopters; abscissas indicate percentage of total number of cases.

tween one and two diopters. There is then an abrupt drop to 13.6 percent for those that had an average of two to three diopters. The decline in the curve is then more gradual up to eight diopters, which was found to the extent of 0.9 percent. After the age of 40 years, the percentage of those in each group having an average of two diopters and higher gradually increases so that between 60 and 70 years of age 24.8 percent were found with an average hyperopia of two to three diopters and 16.9 percent with three to four diopters. In the last group, over 70 years of age, 231 eyes were included. Among these there were none with over five diopters of hyperopia. There were 36.1 percent with an average of one to two diopters and 29.7 percent between two and three diopters.

Myopia. Figures 3 and 4 show graphically an analysis of the 3062 myopic eyes. Here also, a myopia of one to two diopters predominates in all age groups, but the percentage of myopic patients of this degree is never as large as that of the hypermetropic. On the other hand, myopia is encountered in the higher degrees much more frequently than is hyperopia. In other words, in hyperopia, eight to nine diopters was the strongest correction found, with perhaps a few isolated cases of slightly higher degree scattered throughout the various age groups, whereas, in myopia, in nearly all age groups up to 70 years, many more eyes are found in comparison, showing a myopia up to 21 and 24 diopters. The age group under five years is not illustrated because there were only eight of these eyes altogether. Of these there was one showing a myopia of 1.25 diopters and one with 2.50 diopters, two showing a myopia of eight diopters, two of nine diopters, and two of ten diopters. It can be seen, therefore, that few cases of myopia are found in children under five years of age, but when they do occur, it may be rather high. In the groups between 10 years and 30 years, the percentage of eyes with a myopia of two diopters or more increases with a corresponding decrease in the number of those with a myopia of one diopter. It will also be noted that there is an increase in each succeeding age group after 10 years to 15 years to the age of 70 years, of the percentage of eyes showing a myopia over twelve diopters. In the last group, over 70 years of age, none was encountered with a myopia of more than eight diopters but the percentage of all those of two diopters or more show a decided increase with a corresponding decrease in myopia of one to two diopters.

The cases of myopia present many interesting features and in some cases in children they are undoubtedly congenital. One case was of a girl aged nine years, who had a myopia of 16 diopters in each eye with a corrected vision of 6/30 in each eye. The mother stated that the child had always been near sighted. The ophthalmoscopic examination revealed many vitreous opacities in each eye with a typical highly myopic fundus, showing stretching of the nerve head, thinning of the retina, and other changes. One of the children, three years of age, was found on retinoscopy to require O.D. —6.00 D. sph. ⌯ —5.00 D. cyl. ax. 30°; O.S. —6.00 D. sph. ⌯ —4.00 D. cyl. ax. 165°. Another child, three years of age, whose refraction had been tested two weeks earlier by a recognized ophthalmologist, was wearing —10 D. sph. in each eye. We found the same correction and the glasses were not changed. In this case the fundi showed the usual evidences of stretching, associated with high myopia but the mother seemed to think that the vision of the child was markedly improved with the glasses.

Another girl, six years of age, had a myopia of —11 D. in each eye with a vision of 6/21 plus in each eye, as nearly as could be determined. The lens in each eye was clear but some very fine floating opacities appeared in the vitreous. The discs were large and somewhat oval, showing a deep central cup and a marked conus on the temporal side of each. A brother of this patient, aged eight years, also held objects close to the eyes and was found to require: O.D. —6.50 D. sph. ⌯ —3.50 D.

cyl. ax. 15°. With this, vision was 6/15; O.S. —6.50 D. sph. ⌯ —3.00 D. cyl. ax. 165°. With this, vision equaled 6/15. Examination of the discs and fundi revealed practically the same condition as that found in the sister but the floating apacities in the vitreous could not be observed.

Another case was of a girl, now aged 12 years, whose eyes had been tested showed: O.D. —7.00 D. sph ⌯ —0.50 D. cyl. ax. 165°, vision was 6/9; O.S. —7.00 D. sph. ⌯ 1.00 D. cyl. ax. 180°, vision was 6/12. It can be seen from this that the myopia increased after the age of ten years in spite of the fact that she had been wearing the correction constantly.

Convergent Strabismus. Four hundred cases of convergent strabismus

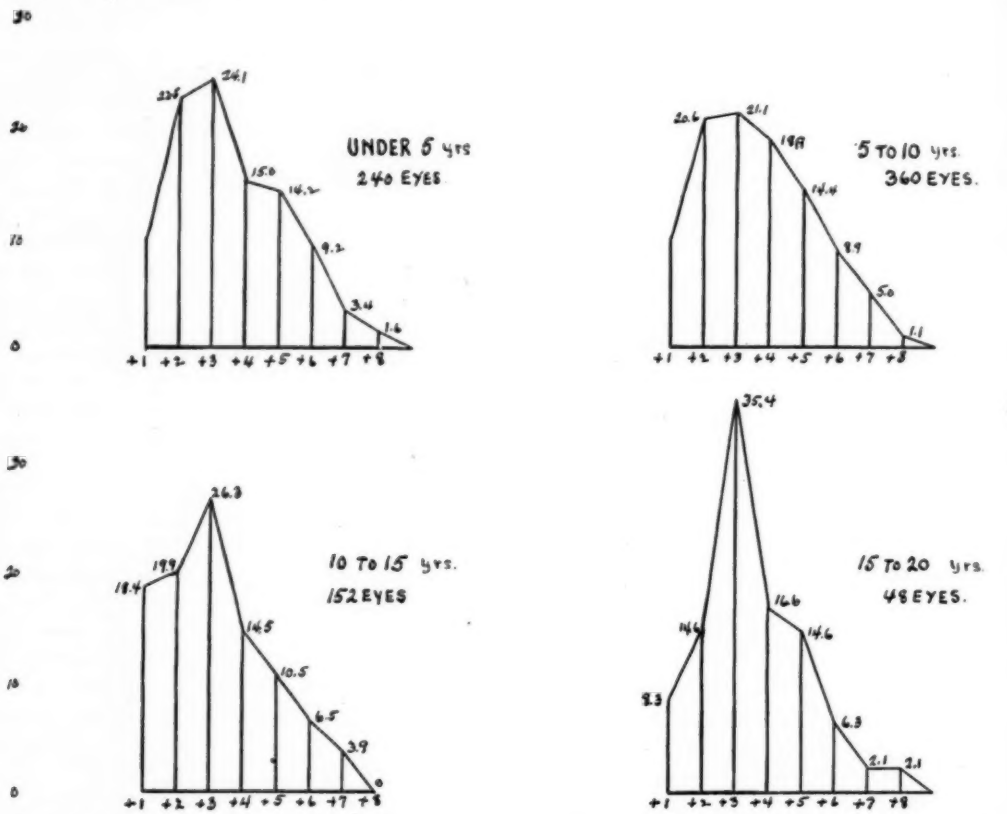

Fig. 5 (Tassman). Spherical refraction in convergent strabismus; 400 cases up to the age of 20 years. Ordinates indicate diopters; abscissas indicate total of number of cases.

three years earlier, when she took: O.D., —6.00 D. sph. ⌯ —.50 D. cyl. ax. 165°, with which, vision was 6/9; O.S. —6.00 D. sph. ⌯ —1.00 D. cyl. ax. 180°, with which, vision was 6/12. One year later she was again examined with the following result O.D. —6.00D. sph. ⌯ —0.50 D. cyl. ax. 165°, with which, vision was 6/9; O.S. —6.50 D. sph. ⌯ —1.25 D. cyl. ax. 180°, vision was 6/12. The result of the last examination at the age of 12 years were collected and arranged in age groups of five years each, up to 20 years, as illustrated in figure 5. The curve here shows a larger percentage of these cases having an average hyperopia of two diopters and more, as compared with the hyperopic patients without squint between these ages. Moreover, an average hyperopia of one to two diopters was most common in the latter group, whereas in the cases with convergent strabismus, a hyper-

opia of three to four diopters showed a greater percentage in each age group and as the percentage of those with the higher degrees of hyperopia decreased, the percentage of those with three to four diopters increased. The youngest patient referred for refraction was seventeen months old and was found on retinoscopy to have a hyperopia of 3.0 diopters in each eye.

third was a girl, R. D., aged 6 years, who had O.D. +2.00 D. sph; O.S. +2.00 D. sph. ⌯ + .50 D. cyl. ax. 90°. The next was a boy, J. D., aged 4 years, who on retinoscopy showed O.D. +2.50 D. sph. +.50 D. cyl. ax. 90°; O.S. +2.50 D. sph. +.50 D. cyl. ax. 90°. The youngest child, R. D., a boy aged 3 years, on retinoscopy was found to have O.D. +2.00 D. sph.; O.S.

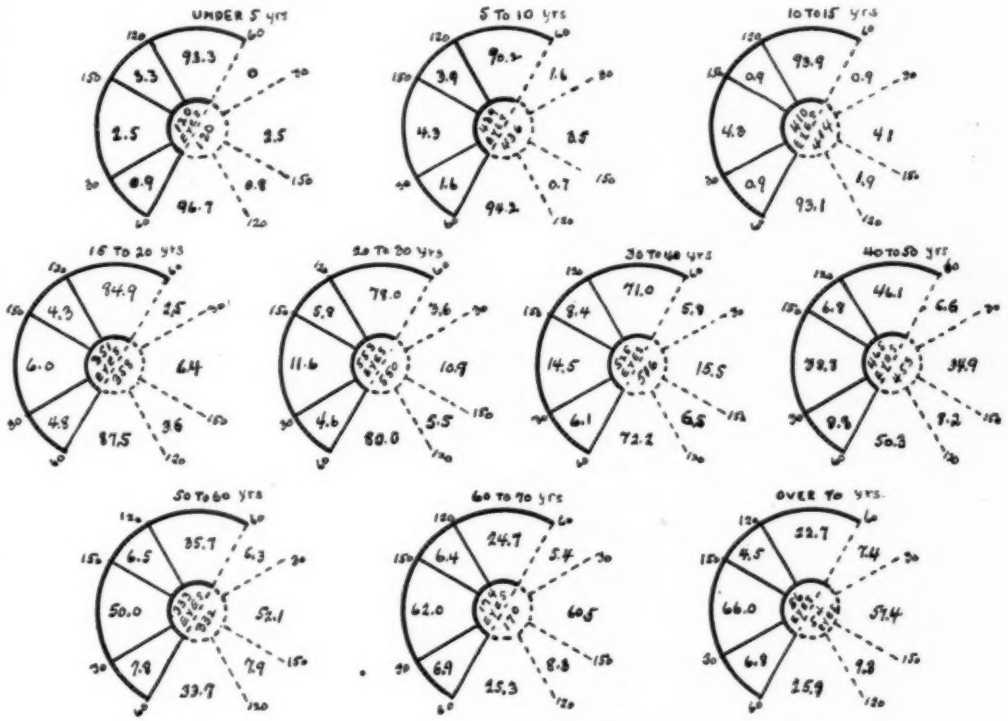

Fig. 6 (Tassman). Axis in hyperopic astigmatism; 6827 eyes. Showing the occurrence of the vertical, horizontal, and oblique meridian. Heavy line = right eye; broken line = left eye.

In one family five children were examined, each of whom had a convergent squint, the right eye being the fixing eye. The oldest of these children was a girl, aged 10 years, whose refractive error was O.D. + 1.50 D. sph. ⌯ +1.50 D. cyl. ax. 75°, vision was 6/9; O.S. + 1.50 D. sph. ⌯ + 2.50 D. cyl. ax. 120°, vision was 6/12. The second child was a girl aged 7 years, who was found to have O.D. +5.00 D. sph. ⌯ +1.00 D. cyl. ax. 90°, vision was 6/6; O.S. +5.50 D. sph. ⌯ + 1.00 D. cyl. ax. 75°, vision was 6/9. The +2.50 D. sph. +.50 D. cyl. ax. 75°. The mother of these children was 41 years of age and had never worn glasses. Her vision was 6/6 in the right eye and 3/60 in the left, and the left eye was slightly convergent under cover, but ordinarily her eyes were held fairly parallel. A fundus examination of the mother's eyes showed no evidence of any disease, but she was unwilling to undergo refraction herself.

In the cases of strabismus examined, it was found that nearly always the deviating eye revealed the higher de-

grees of astigmatism and astigmatism in an oblique axis was found mostly in these eyes.

Astigmatism. The astigmatism in hyperopia is usually considered to be according to the rule when the axis of the correcting cylinder lies in the vertical meridian and against the rule when it is in the opposite meridian. The cases of hyperopic astigmatism are illustrated in figure 6, where they are arranged in age groups to show the percentage of eyes, both right and left, in which the axis of the correcting cylinder was in the vertical, horizontal, or oblique meridians. The vertical meridians were here taken to include those between 60° and 120°; the oblique meridians from 120° to 150° and 30° to 60°, while the horizontal meridians included those from 30° to 150°. The right eyes in the figure are illustrated by the heavy black line while the left eyes are represented by the broken line. It can be seen from the graphs how the axis of the correcting cylinders in the vertical meridian occurs to the extent of 93.3 percent in the right eye and 96.7 percent in the left eye, in those under 5 years of age, whereas in those over 70 years, there is a decrease to 22.7 percent in the right eye and 25.9 percent in the left eye. At the same time, the axis in the horzontal meridians changes from 2.5 percent in each eye in those under 5 years to 66.0 percent in the right eye and 57.4 percent in the left eye in those patients over 70 years. There is a regular and uniform decrease noted in every succeeding age group. In the oblique meridians the changes are also fairly regular, the percentages here increasing up to the age of about 40 years after which they remain rather constant until the age of 70 years.

Myopic astigmatism is illustrated in figure 7, and here the condition is, of course, reversed, but the differences are perhaps not as great as those seen in hyperopic astigmatism. The group under five years of age is not shown here since only eight such eyes are recorded. In the group five to ten years, the ratio of the vertical and horizontal meridians is 14.7 percent in the right eye and 15.1 percent in the left, to 79.4 percent in the right and 81.8 percent in the left, which changes the groups from 60 to 70 years to 34.8 and 35.4 percent in the vertical meridians and 52.2 and 52.4 percent in the horizontal meridians. In other words, the percentage of those against the rule never becomes as great as those with the rule at any age.

In myopic astigmatism it is also noted that there is a rather marked increase with age in the percentage of those in whom the axis is found in the oblique meridians.

In conclusion, several facts should be mentioned since they stand out as the result of the examination of such a large number of patients of all ages.

First, it should be repeated that the use of a mydriatic for accurate results in retinoscopy and refraction in younger people up to the age of 40 to 45 years is almost indispensable. Furthermore, any ill effects from the use of the drugs prescribed for this purpose and used as directed, are negligible.

Hyperopia in children up to the age of five years occurs in 97.8 percent of the number of eyes examined. Myopia is comparatively rare at this age, but when it was found, it occurred to the extent of eight diopters. In these cases it would appear to be congenital.

The occurrence of the higher degrees of hyperopia diminishes in the older children, whereas the higher degrees of myopia are found in children who have reached school age and during the years in which they are actively engaged in school work.

In hyperopia, an average of between one and two diopters is most commonly found and occurs in an average of 37.7 percent of those of all ages. From one to two diopters of myopia were found to occur in an average of 32 percent of the cases of all ages. Hyperopia was found to range in all age groups as high as nine diopters, with one or two cases presenting up to 12 diopters, whereas, a myopia as high as 20 to 24 diopters and occasionally higher was

encountered in nearly all age groups after ten years.

Astigmatism in hyperopia and myopia was found to exist in about 71 percent of the cases examined. Up to the age of 40 years, astigmatism against the rule occurs in greater proportion in myopia than in hyperopia, but after 40 years of age a very marked change takes place, with astigmatism against the rule occurring in greater proportion in hyperopia.

In convergent squint, the incidence of the higher degrees of hyperopia is greater than it is in the other cases. In nearly every case of convergent squint in a child, the mother always emphasizes the fact that the condition came on following some mishap such as a fall, or some illness, as whooping cough, measles, scarlet fever or chicken pox.

Lastly, it might be emphasized that the refraction of a patient's eye should not be considered as merely a mechanical procedure. Many complaints and subjective symptoms for which patients are often tested for glasses require careful consideration from the standpoint of possible disease of other organs as well as of the presence of the refractive error. Older patients especially may be suffering with some systemic condition having a bearing on the complaints for which the patient's eyes are being refracted. By reason of his medical training and experience, the ophthalmologist is enabled to give the consideration necessary in the proper management of the case with respect to the possible associated conditions, either within or outside the eye.

The Wills Hospital.

Fig. 7 (Tassman). Axis in myopic astigmatism; 1813 eyes. Showing the occurrence of vertical, horizontal, and oblique meridians. Heavy line = right eye; broken line = left eye.

NOTES, CASES, INSTRUMENTS

PULSATING EXOPHTHALMOS

VON HALLER BROBECK, M.D.
COLORADO SPRINGS

This case of pulsating exophthalmos is reported because of the unusual history, bilateral involvement, the length of time elapsing between injury and operation (ligation of the left internal carotid), and the favorable outcome after an appearance of almost certain fatal termination.

Fig. 1 (Brobeck). Pulsating exophthalmos. Note massive chemosis on the left, with left facial paralysis. Patient comatose when picture was taken, October, 1931.

Wm. V., a negro, aged 51 years, had been in good health prior to his injury on July 4, 1931, when he was struck above and behind the left ear with a hammer. He was in a comatose condition for one week in a Canadian hospital where he remained for one month, after which he migrated to Kansas City and entered a hospital, which he left after two months. The records from the above mentioned institutions were not available but it was established that he had a large amount of proptosis of both eyes and that there had been noises in his head.

He arrived in Colorado Springs from Kansas City by train, unaccompanied. The first picture shown was taken four days later, October 14, 1931.

The most notable feature of the case was the bilateral proptosis, extremely prominent on the left, 14 mm.; on the right, 8 mm., with marked chemosis and prolapse of each lower palpebral conjunctiva. He was semicomatose at times, restless, and occasionally delirious.

Right eye: Cornea slightly hazy; the pupil, 3½ mm., did not react directly to light; projection good. He counted fingers at five feet. Media were clear, nerve edges distinct, but the veins were tortuous, distended, and showed marked pulsation.

Left eye: Questionable light perception; the pupil, eccentric in shape, reacted to direct and consensual stimulus. Cornea quite hazy; at "five o'clock" a small dessicated area was noted (keratitis e lagophthalmo).

Both eyes showed limited motility, but movement in all directions could be elicited.

The left side of the face was paralysed, the tongue protruding at the mid-line. His speech was coherent and at times he was lucid mentally.

Pulse was 58. A loud bruit, synchronous with the heart beat, was heard over both eyes, any part of the face, scalp, and neck. It was especially loud over the left frontal and occipital regions.

No Babinski sign was present; right patellar reflex increased; ankle clonus on the left (doubtful); no Oppenheim. Tactile and muscle senses were normal. There was a positive Romberg with tendency to fall to the left. Wassermann was negative.

On October 20, the patient was taken to the hospital where an x-ray examination was made and reported as follows: "Question of small fracture line on the left in the posterior fossa extending down from the lower margin of the occipito-parietal suture posterior to the temporal bone. This is not positively identified but strongly suggests fracture. No other changes in the skull as the result of trauma; no depression recognized."

On October 21, 1931, Dr. Harry W.

Woodward operated on the patient at the Glockner Hospital. The internal carotid was promptly ligated under ether anesthesia. The bruit disappeared immediately. No complications occurred on the operating table.

On March 1, 1932, the vision O.D. was 1.2, O.S. was 1.0. Fundus was negative in each eye. Patient read and went about unassisted. There was no bruit to be heard over the eyes or skull, but he had faint noises in his head at times. Proptosis of the left eyeball equaled 3½ mm. Convergence was normal, accommodation 2.50 D. in each eye.

Fig. 2 (Brobeck). Picture taken March, 1932. Slight divergent squint; 3 mm. proptosis of left eye.

Both pupils reacted to direct and consensual stimuli.

The left facial paralysis still existed. There was some divergent squint and diplopia, which was noted especially at night.

The slitlamp showed a small posterior synechia in the left eye behind the corneal opacity at "six o'clock."

Comment: It is of paramount importance that the ophthalmologist consult with a skilled surgeon in these cases. An intimate knowledge of the anatomical relations in this most vulnerable region of the neck is required. In this particular case the veins throbbed and were greatly distended making it difficult to distinguish them from the arteries. The internal carotoid was pushed well up beneath the ramus of the mandible.

Colorado Springs.

SEVERANCE OF THE MEDIAL RECTUS MUSCLE IN AN OPERATION FOR PTERYGIUM—REATTACHMENT

B. F. Payne, M.D.
HOUSTON

Divergent squint following an operation for pterygium is extremely rare at the present time. I have seen only one case and heard of one other. Both were in the private practice of Dr. Wallace Ralston and referred to him by the same man, who operated for the pterygia. It is not uncommon to see cases of exotropia following injuries in the region of the inner canthus, usually from penetrating wounds, but with the rapidly disappearing practice of free tenotomy and the acceptance of the Jameson technique and its modifications, one sees fewer exotropias from operative procedure.

The first case was that of a young girl aged twenty years. She had a marked exotropia, measuring thirty-two degrees, which was remedied by reattachment of the medical rectus. The second case was that of a man of thirty-three years, who was operated on six months before he came to our office for consultation. He had been operated on for ptergium in May, 1931, at which time the surgeon dissected and removed the entire "roots" of the growth.

There was an operative scar on the right bulbar conjunctiva about midway between the limbus and the inner canthus, which extended upwards and was adherent to the upper lid on its inner and medial aspect. The right eye diverged, the exotropia being thirty-five prism degrees for near and thirty-seven prism degrees for distance. It measured approximately twenty-three degrees on the perimeter.

The corneæ were clear and there was some sign of a pterygium on the right globe. The irides were normal in appearance, the pupils were equal and reacted to both light and accommodation. Media and fundi were negative. Diplopia was present and recorded on the tangent screen, showed a definite in-

volvement of the right medial rectus muscle.

A diagnosis of severance of the medial rectus muscle, with symblepharon, operative, was made. The following operation was performed:

A vertical incision was made over the line of the old scar which was dissected out as well as possible. The conjunctiva was undermined above, below and medially, in order that a flap might be fixed over the area of the symblepharon. The muscle was separated as well as possible and reattached by means of two double-armed silk sutures. The conjunctiva was approximated with interrupted sutures and a tongue was carried over to the surface of the lid. There was a slight overcorrection on leaving the table. Both eyes were occluded.

The eye was dressed on the third day and orthophoria was found for near and distance. He had slight limitation of movement outward in the operated eye. Recovery was uneventful. The culde-sac above was in good condition. The near point of convergence and the converging power were within normal limits but outward movement of the right eyeball was checked at approximately twenty degrees on the perimeter. He had no diplopia except on looking to the right and that was disappearing probably on account of suppression. There was a retraction of the globe measuring slightly less than three millimeters with the exophthalmometer. On looking to the right, he had a reverse of the "Duane syndrome".

1304 Walker avenue.

SOCIETY PROCEEDINGS

Edited by Dr. H. Rommel Hildreth

PITTSBURGH OPHTHALMOLOGICAL SOCIETY

March 22, 1932

Dr. Edward B. Heckel, president

Retinoblastoma

Dr. Edward Stieren reported the case of a four-year-old girl brought for examination on August 2, 1930, by the child's mother, on account of a yellowish-white reflex to be seen in the right pupil. This was noticed at the time of an attack of measles about two and one-half months previously, although an aunt thought that a "white spot" had been visible prior to that date. At the time of the first examination, under atropine mydriasis, the vitreous appeared to be filled with a dirty, yellow mass, the upper portion having a gray appearance, and moving with movements of the eyeball. Although the history and ophthalmoscopic appearance suggested a diagnosis of metastatic choroiditis, transillumination performed under a general anesthetic revealed a distinct shadow when the light was projected through the sclera from below, the remaining quadrants being clear. Tension taken with the McLean tonometer was 35. Pathological examination of the enucleated eye showed detachment of the retina in the inferior portion overlying two nodules. Histological study showed these nodules to be retinoblastomata. Serial sections of the removed portion of the optic nerve failed to show neoplastic extension. Six months after enucleation the patient appeared to be free from local recurrence or metastic involvement.

Tear-gas injury of both eyes

Dr. J. Clyde Markel presented A. L., aged twenty-one years, who on December 9, 1930, picked up from the floor of a garage an object resembling a fountain pen. He accidentally pulled the trigger, the resulting explosion hurling the contents of the container into his face and eyes. He was immediately removed to a hospital where the eyes were irrigated, atropine instilled, and iced compresses applied. Opiates were necessary for the severe pain. Within twenty-four hours the forehead, nose, and eyelids exhibited severe burns with marked swelling. Separation of the tense swollen lids with lid elevators was followed by a gush of straw colored watery secretion. At this time the corneæ appeared clear, the conjunctivæ very chemotic. Three days later the corneæ had become quite hazy with ulceration that spread very rapidly until the entire cornea in each eye was involved. Nine days after the injury the patient experienced sudden pain in the right eye, evidently due to rupture of the ulcerated cornea. By this time the conjunctivæ, especially in the right eye, appeared to be in shreds, resembling wet tissue paper. Discharge from both eyes was free. Two weeks after injury the burns of the skin had practically healed, whereas there was extensive purulent infiltration of all layers of the corneæ except for a narrow peripheral zone. When the patient left the hospital one month after injury, both corneæ showed extensive, rather uniformly dense scarring with very little secretion from the eyes. There was also a pigmented ectasia of the cornea and symblephara (multiple) of the lids, of the right eye.

Tear-gas injury of both eyes

Dr. Adolph Krebs reported the case of J. M. D., aged thirty-two years, who during an altercation with a police officer on January 29, 1930, suffered injury to both eyes when the officer fired a tear-gas gun into his face. The patient thought that the gun was discharged within a few inches of his face as some of the wadding struck his nose. When seen by Dr. Krebs two weeks after injury, there was a large ulcer of the left cornea with hypopyon. Except-

ing a small segment in the upper zone, the cornea was hazy. The nasal half of the right cornea was hazy, with a small denuded area, while the temporal half was fairly clear. Vision in the right eye was 3/60; that in the left, hand movements only. About one year following injury, corrected vision in the right eye was 7/8; vision in left, light perception only. The right cornea showed a permanent opacity involving the entire nasal half, while the left cornea was quite opaque and extensively vascularized.

Evulsion of the optic nerve

Dr. D. H. Rhodes (by invitation), presented a colored boy aged twelve years, first examined on September 21, 1921, at the Eye Dispensary of the Mercy Hospital. About August 1st while at play the patient was struck in the left eye with a small apple hurled by a playmate. This was immediately followed by severe pain in the eye for four days, subsiding under treatment but with no return of vision in the injured eye. Examination revealed 20/20 vision in the right eye; no light perception in the left. There was slight pericorneal injection of the left eye, with a dilated pupil, unresponsive to light. Fine vitreous opacities were present. At the site of the optic disc, there was a punched-out area of reddish color. The arteries and veins stopped abruptly at the edge of this area. Careful focusing on the edge of this excavation brought out the nerve outlines. A cherry-red spot similar to that seen in embolism of the central artery of the retina, was present at the macula. The intraocular tension was slightly elevated. Subsequent examination at a later date showed the retinal arteries to be again filled with blood. At the time of the first examination they were greatly attenuated with the appearance of complete collapse in places. At the present time examination of the fundus with the Bausch and Lomb binocular ophthalmoscope showed a very deep gray excavation at the site of the nerve head. Judging from the literature, evulsion of the optic nerve was an uncommon injury, but was probably not so rare as the reported cases would seem to indicate.

Occlusion of central retinal artery

Dr. W. E. Carson presented Mr. B., aged fifty-three years, who suddenly noticed a "black cloud" before the left eye two days prior to the first examination on November 16, 1931. During the first eight hours after onset, blindness in the affected eye alternated with some vision four times, followed by complete loss of sight. Ophthalmoscopic examination of the left eye revealed a lusterless retina over the posterior pole with a rather small red, to copper colored, granular disc-like area, but not a typical cherry-red spot, at the macula. No procession of blood columns was to be seen. Rather marked angiosclerosis of the retinal vessels was present in both eyes. On November 23rd the patient reported slight return of vision, noticed three days before. Vision in the left eye was 1/180. At this time there was typical procession of segmented blood columns in the larger retinal veins, less retinal edema, and no cherry-red spot at the macula. Campimetric study showed islands of fairly good vision for form, to the temporal side of the fixation point with dim vision for form between these islands. A small island with vision for red was also outlined adjoining the temporal side and slightly below the fixation point.

Unilateral reflex iridoplegia

Dr. H. H. Turner reported the case of C. W. F., aged twenty-eight years, who was first examined on February 20, 1932. The patient stated that his left pupil had been dilated for the past three weeks, and that there had been some ocular pain for several days. Corrected vision in each eye was 20/20. Aside from the anisocoria, external examination was normal. Form fields for each eye were normal. Ophthalmoscopic examination revealed no significant changes in the fundi. The left pupil was dilated almost ad maximum and was immobile to direct and consensual light stimulation; both pupils reacted normally to accommodation. With maximum accommodative effort the

left pupil was slightly smaller than the right and on distance fixation returned rather slowly to the dilated state. The general examination revealed some apical dental infection and a possible ethmoiditis. The blood Wassermann was reported negative on repeated tests; that of the spinal fluid was not examined owing to failure on repeated attempts to obtain spinal fluid. The patient stated that similar attempts had failed previously. Dr. Harold Mitchell, on neurological examination, found an absence of all tendon reflexes, which he stated, was not an unusual phenomenon. It was his opinion that the ciliospinal center for dilatation was not involved in this patient. Dr. Turner said that according to Fuchs, the lesion causing a unilateral reflex iridoplegia as present in this patient, must be situated immediately anterior to the homolateral third nerve nucleus in the floor of the fourth ventricle, where it would involve the direct fibers passing from the superior quadrigeminal body to the third nerve nucleus as well as the decussating fibers from the contralateral superior quadrigeminal body to the homolateral third nerve nucleus. The lesion producing the bilateral Argyll-Robertson pupils would be situated slightly anterior to the one just described. According to Fuchs, unilateral reflex iridoplegia was rare. An unusual feature in this case was the wide dilatation of the pupil.

Electric cataract

Dr. D. H. Rhodes (by invitation) reported the case of J. G., aged fourteen years, who in May, 1930, received an electric shock from a 6900 volt line. He suffered a severe electric burn of the scalp at point of contact; also burns of the left forearm, inner side of left foot and outer side of right foot. The late Dr. L. Mitchell who examined the patient's eyes the day after the injury, reported nothing abnormal. When first seen by Dr. Rhodes on February 7, 1932, the patient stated that there had been practically no vision in the right eye for the past five months. On examination, the vision of the right eye was 8/200; the left, 20/30. Aside from the lenticular changes about to be described, the ocular examination revealed no abnormalities. On slitlamp examination, scale-like opaque plaques on the anterior and posterior capsules with subcapsular opacity more marked in the anterior nasal half of the lens of the right eye were observed. The posterior opacity was greatest at the pole. The remainder of the lens substance was relatively clear. In the left eye similar scale-like opaque capsular plaques, especially in the upper temporal quadrant were present. There was some involvement of the posterior capsule. The inferior nasal quadrant of the anterior capsule and the lens substance were clear. On March 26, 1932, corrected vision was, O.D., 20/200; O.S., 20/25. Treatment consisted of using five percent dionin. In conclusion, Dr. Rhodes cited cases reported in the literature and gave the following summary of present knowledge of electric cataract. (1) The time of onset varied from three weeks to two years. (2) Voltage, reported as producing cataracts, had been as low as 220 and as high as 50,000 volts. (3) The eye nearest the burn usually showed the most marked change. (4) Head contact was reported to be necessary for the production of electric cataract. (5) Hess found from laboratory experiments on animals that the anatomical lesion was a destruction of the lenticular epithelium. (6) Electricity was known to have a selective action upon epithelial elements.

Bilateral cataracts following exposure to an electric flash

Dr. Edward B. Heckel reported the case of D. R. W., aged twenty-nine years, who gave the history of having been exposed to an electric flash on September 26, 1926, resulting in burns of the face and carbonization of the eyebrows. Subjective onset of failing vision was first noticed five months after injury. When first examined on February 13, 1928, the vision in the right eye was 15/200, in the left, 20/200. There was partial opacification of the lens in each eye, which later be-

came complete. A simple cataract extraction was performed on the right eye and later an extraction following a preliminary iridectomy in the left. After correction of the resulting aphakia, vision in each eye was 20/30.

Discussion (of case reports by Drs. Heckel and Rhodes). DR. KREBS said that the so-called red and green cholesterin crystals observed beneath the lenticular capsule in Dr. Rhodes' patient occurred in all forms of degenerative lenticular conditions; also, in tuberculous involvement of the iris and vitreous. Koeppe pointed out that their presence was suggestive of tuberculous rather than other forms of iridocyclitis.

DR. GEORGE H. SHUMAN said that a superabundance of "cholesterin" crystals was not uncommon in the early stage of traumatic cataract. According to Koeppe, electric cataract could be classified into two types on the basis of slitlamp studies. In the first, the opacities were corkscrew or linear in shape, running in all directions and were situated in the deeper cortical substance of the lens. In the second type, they more nearly resembled the traumatic cataract in appearance, consisting of subcapsular opacities tending to follow the sutures of the lens, with rosette formation. Dr. Rhodes' case did not conform exactly to either type. In his patient, the cholesterin crystals and flaky opacities were capsular or immediately subcapsular and in addition, there were subcapsular vacuoles beneath the posterior capsule of the lens in the right eye somewhat resembling the appearance of cataracta complicata.

DR. HECKEL said that Hess' experiments indicated that it was the epithelium of the capsule that was injured and that this would result in interference with the nutrition of the lens and so favor cataract development.

DR. JOHN S. PLUMER said that while cataractous changes had been produced experimentally in the eyes of the living animal by electric shock, such attempts on the enucleated eye had failed. Also, that the observation of Franklin and Cordes that cataract might follow electric shock within a period as long as two years afterward was of considerable importance from the medicolegal standpoint in compensation cases.

DR. CARSON said that on account of the medicolegal importance in compensation cases, as just mentioned by Dr. Plumer, it would be well for the general surgeon to be advised on this point and to have such patients examined by an ophthalmologist as soon as possible.

JOHN S. PLUMER,
Recorder.

COLLEGE OF PHYSICIANS OF PHILADELPHIA

Section on ophthalmology

December 17, 1931

DR. H. MAXWELL LANGDON, chairman

Removal of oxidized tissue remaining after foreign body in cornea

DR. GEORGE H. CROSS read a paper on this subject in which he said that corneal burrs were used to remove the brownish-stained, burned tissue which remained in the cornea following the removal of hot metallic foreign bodies. The burrs were used to remove the under cut edge of a foreign body crater so annoying to the patient, often causing him to return in a short time, complaining that all the foreign body had not been removed. This edge provided an excellent harbor for bacteria, that might produce infected ulcers. Burrs were useful to smooth out the roughened surface area from which a foreign body had been removed. Originally, burrs were soldered in metal handles, which were too expensive to throw away.

A handle for corneal burrs, manufactured by George P. Pilling and Sons in Philadelphia, provided a satisfactory way to hold the burrs and permitted quick changing from one size to another as the case might require. The burrs were made in different sizes, were inexpensive and could be purchased from instrument or dental supply firms.

Lupus erythematosus of the conjunctiva and eyelids

DR. JOSEPH V. KLAUDER and DR. PERCE DELONG said lupus erythematosus

of the conjunctiva was an extremely rare condition. English and American authors who made mention of it did not describe the disease. The few cases that had been reported had been by foreign writers.

Three patients, two women and one man, with lupus erythematosus of the conjunctiva were shown. In two, the conjunctival lesion had been previously diagnosed trachoma. The clinical picture, however, did not present the characteristics of trachoma, in that in neither patient were there any granulations or follicles. In one patient there was an extreme redness of the conjunctiva, with a velvet-like edema, involving the exposed surface of the conjunctiva of the upper lids. The involvement was more pronounced on one eye. The patient complained of photophobia and mucoid discharge. In the second patient, the appearance of both lower lids was similar to the foregoing. In addition there was lupus erythematosus of the skin and lid margins. The third patient showed edema of the conjunctiva of one eye, with a sharply defined violaceous patch and in addition a well outlined depressed area which was dry, bluish white, and atrophic in appearance.

The diagnosis of lupus erythematosus of the conjunctiva was suggested by the finding of typical lesions of the disease elsewhere on all of the patients. The characteristic features of this disease in the skin could be correlated with conjunctival involvement, such as violaceous color, edema, sharp margins, and later, the appearance of atrophy.

Lupus erythematosus on the eyelids looked essentially like the disease on the skin. On the lid margins it superficially simulated blepharitis. The following features were characteristic; the lid margins were dry, not moist, and covered with finely adherent scales; the color was somewhat violaceous, not red and inflammatory; there was no matting of the eyelids. Later, the margins were atrophic, their surfaces irregular, the violaceous color disappeared and the cilia were permanently destroyed. Since atrophy caused by lupus erythematosus was not of a contractile nature, ectropion or eversion of the lid margins were not likely to occur.

The patients were treated with gold and sodium thiosulphate which had been effectively employed in the treatment of lupus erythematosus elsewhere. Such treatment had caused either complete or almost complete disappearance of the various lesions of the disease at the time of presentation. Treatment was being continued.

Lymphomas of the conjunctiva

DR. C. E. G. SHANNON and (by invitation) DR. L. F. MCANDREWS presented a report of a case of bilateral lymphomas of the conjunctiva published in this Journal, v. 15, no. 9, p. 821.

Discussion. DR. B. L. CRAWFORD said that lymphomas of the conjunctiva had a very characteristic histological appearance. The lymphomas in this location seemed to be more definitely neoplastic than in other locations of the body. The diagnosis of lymphoma was frequently made in lesions of other parts of the body where there was a more or less indefinite collection of lymphoid type of cells without true tumor formation. This neoplasm, as illustrated by the lantern slide, was composed of a fairly uniform type of cell which closely resembled the lymphoid cell, rather loosely arranged with little stroma and numerous small blood vessels. In differentiating the lymphomas from round cell sarcomas, there were several points to be considered, as follows: malignant tumors were rarely multiple as in this instance; the uniformity of the type of cell and the lack of irregularity of the cells and the absence of mitosis of the nuclei usually seen in malignant tumor; the type of blood vessels in the stroma and the presence of a fairly definite capsule. Leukemic infiltration was excluded by a careful examination of the blood.

DR. ZENTMAYER asked whether the blood vessels in lymphomas were not different from those in a malignant tumor. Through the courtesy of Dr. Shannon he had seen this patient before treatment was started. With the history and a negative physical and

blood examination he had suggested the possibility of its being a case of amyloid degeneration of the conjunctiva. He said he had no apology to offer as in the pathological report in one of the cases, hyaline degeneration was noted as a feature.

DR. SHANNON, in closing, said that the three points of interest, in his opinion, were: first, its rarity, about 30 cases having been reported in which blood and histologic studies had been made; second, the rapid disappearance of the growth following the application of radium; and third, the fact that while radium was applied to the left side only in the early treatment of the case, both eyes responded equally well. He had no explanation to offer for this phenomenon.

A. G. FEWELL,
Secretary.

ST. LOUIS OPHTHALMIC SOCIETY

February 26, 1932

DR. JULIUS H. GROSS presiding

Incipient cataract

DR. M. H. POST presented a paper on this subject which will be published in the Missouri State Medical Journal.

Discussion. DR. JOHN GREEN said, in regard to information given patients with incipient cataracts, that he drew attention to the advancing years, the general lowering of capabilities which the patient could correlate with the obviously lowered vision. He would try to avoid the term cataract which to so many people had an ominous connotation. He did not believe that refraction had any bearing on the development of cataract. Statistics as to the incidence of cataracts at different ages would seem to need revision as most examinations had been made with undilated pupils. Wide dilatation and slit-lamp study would change the figures regarding age incidence of cataract. Two percent suprarenal bitartrate was suggested as a safe mydriatic. Dr. Green felt that treatment with subconjunctival injections of mercury had some value in cases with slight diffuse opacities but none in nuclear or cortical cataracts. Improvement would be permanent in some cases after a single injection. Improvement in vision after any kind of therapy might be merely spontaneous or because of better adapted lenses.

DR. F. E. WOODRUFF believed that the apparent improvement after treatment was due to the patient becoming more familiar with the trial letters. Illumination affected the visual acuity, being different on dark days from what it was on bright days. Beginning cataract might cease to develop regardless of therapy, but treatment might be justified for the mental comfort of the patient.

DR. J. ELLIS JENNINGS called attention to the fact that opacities of the lens might exist for years without bother to the patient and believed it his duty to save them the worry and dread of knowing they had cataract.

DR. POST, closing, agreed the word cataract was to be avoided but felt the patient should be told that something was developing, otherwise he would distrust the doctor's word. He believed eyestrain to be a conducive factor. The use of colored glasses reduced glare and were recommended. He also regarded dilatation of pupils of value in certain cases with nuclear cataract.

Hemorrhagic glaucoma and closure of the retinal vessels

DR. HARVEY LAMB read a paper on this subject and showed sections of several eyes with this condition. The paper will later appear in this Journal.

Discussion. DR. W. E. SHAHAN said one of the eyes shown by Dr. Lamb was from a patient he had had under observation for a number of years. The patient had a phobia against being operated on. One eye had been operated on earlier but he would not consent to operation on the other until pain made its removal necessary.

Another case Dr. Shahan had seen was one of chronic retinal hemorrhage of years standing. One eye finally developed glaucoma with high tension and had to be removed because of pain.

No operation had been performed for the glaucoma because he had feared the hemorrhagic condition of the retina would prove disastrous.

Tear gas burn of eye

Dr. M. W. Jacobs reported a case which will be published in this Journal.

Discussion. Dr. N. R. Donnell recalled having treated a similar case in which a truck driver had received a discharge of tear gas at close range. The cornea had been permanently damaged and the vision never became quite clear. The treatment had been with boric acid irrigations and cold packs which gave marked relief, but several weeks passed before the eyes were quiet. Final vision was 20/50.

Dr. Jacobs, closing, said he had found in the literature, mention of unfavorable prognostic signs noted in cases of soldiers gassed in the war, namely, marked injection of bulbar conjunctiva above and below with a white rim in the margin of the fissure indicating early necrosis. The serious effects became apparent a few days after the injury. This picture did not refer to tear gas which was not used extensively in the World War although discovered in 1887.

B. Y. Alvis,
Editor.

MINNESOTA ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Section on ophthalmology

January 15, 1932

Dr. John F. Fulton presiding by invitation

Mauksch operation for chronic glaucoma

Dr. Walter C. Camp (Minneapolis) said that the procedure was primarily a suprachoroidal iridotasis or a combination of cyclodialysis and iridotasis. From an operative standpoint, it was the ideal filtration operation, being a combination of sclerotomy, cyclodialysis, iridectomy, and iridotasis. He said that Suker had obtained uniformly good results in twenty-four operations.

Dr. Camp presented a case of absolute glaucoma in the right eye with tension 66 mm. (Gradle-Schiøtz). The eyeball was very tender and painful. There was marked glaucomatous cupping of the disc, and optic atrophy. The patient was operated on, December 31, 1931. The reduction of the high tension after this operation was slow but more permanent then after cyclodialysis, and there was less danger of infection than after a subconjunctival iridotasis.

Discussion. Dr. C. N. Spratt (Minneapolis) said that Gjessing had reported the results of iridencleisis operations in 152 cases which had been observed from six to 159 months. There was no question but what the Mauksch operation had the advantage of no danger of secondary infection, and the only question was whether the results were lasting.

Dr. Walter Fink (Minneapolis) said that Suker's article stated that this method was employed chiefly because it gave a pigmented tract through the field of drainage. Also, he had warned against prolapse of the choroid if the sclera cut was too great and against pulling the iris too far through the channel. There was quite a marked inflammatory reaction which subsided without any effect.

Dr. F. E. Burch (St. Paul) wondered how much value was due to separation of the ciliary body from the scleral spur (favoring drainage through the ligamentum pectinatum) and how much to actual suprachoroidal drainage. He did not believe the pigment or epithelium inclusion factor very well proven as yet.

Gonin's operation for retinal detachment

Dr. F. E. Burch (St. Paul) gave a paper on this subject and reported a case.

Discussion. Dr. H. W. Grant (St. Paul) said that operation for detachment of the retina must be considered an old procedure, for James Ware

practiced scleral puncture with a cataract needle before 1830 according to MacKenzie's book published in that year. As mentioned by the author, measures such as trephining, never exactly sufficed. Cautery, without reference to the retinal tear or hole, had been practiced for years, but cautery into the vitreous through the retinal hole was the really new procedure.

He did not believe that one should scorn the present statistics of fifty percent cures, for cases had been unselected, technic had been admittedly faulty at times, and, above all, one must never forget the fact that a pathologic process of unknown origin was probably always present in spontaneous detachment.

Kraupa (Klin. Monat. f. Augenh., 1930, v. 84, p. 406) had made an interesting observation regarding the pathogenic importance of retinal tears. He observed a myopic patient who had lost one eye by detachment and had a hole in the retina of the other eye but no detachment until one year later, at which time the edges of the hole were first seen to be elevated.

A survey of the literature impressed one with the opinion that those reporting results as successful as Gonin had spent much time locating retinal tears, mapping them on the sclera and, above all, perfecting the technic. Vogt, Clausen, Gonin, and others were able to locate tears in about ninety percent of the cases. The indirect method of ophthalmoscopy seemed to be the method of choice. Much more time was spent in finding the tear than in actual operation. Complete dilatation of the pupil, with injection of cocain or adrenalin subconjunctivally, might be necessary. Dividing the eye into twelve meridians corresponding to the numerals on a clock, and using the tangent screen or perimeter, were valuable adjuncts. Scleral transillumination, in conjunction with ophthalmoscopy, might be useful because of its simplicity, and although not yet proved, was worthy of consideration. Insertion of an instrument through the hole or tear, as described by Vogt, offered additional localizing information. Thermocautery probably prevented retinal hemorrhage of a severe nature, and was advised over Paquelin cautery. Postoperative treatment and successive operations should be carefully followed, and the patient so advised.

DR. BURCH (in closing) felt that finding of a tear or hole should be considered the first question to be settled before deciding on the procedure to be employed. Gonin had emphasized the fact that recumbency, indirect ophthalmoscopy, and repeated examination of the patient would permit finding the tear or hole in a large majority of patients, and that in most instances it would be found above and on the temporal side.

Gonin published his first series of cases about 1927 and, at the Amsterdam Congress, he reported some 100 operations; he also reported 250 observed cases in 1930, and in his latest report (September, 1931, Annals d'Oculistique) he included observation of 300 patients of whom 221 were operated on. Sourdille considered cases cured if they remained reattached for a period of six months. Dr. Burch believed that some of Sourdille's were reported cured over a longer period than Gonin's cases.

Congenital syphilis involving the eye

DR. ERLING HANSEN (Minneapolis) reported the case of a girl, nineteen years of age, having active interstitial keratitis. She was treated by a malarial infection, tertian type, allowing thirteen chills before quinine was instituted. The temperature rose as high as 106.° Her general condition remained good. The photophobia and circumcorneal injection lessened considerably and the corneæ seemed to clear, especially in the periphery. No antiluetic treatment had been given.

The malarial treatment of syphilis had been used chiefly for nervous system involvement. Dennie had reported the effective use of malaria in four cases of interstitial keratitis, materially shortening the time for improvement over the usual forms of therapy.

Other fever producing methods had been used but apparently with less

effectiveness than with malarial therapy.

Discussion. DR. FULTON said that judging from his own experience and from the extensive recent literature, bismuth was the drug of choice in the treatment of congenital syphilitic conditions of the eye.

DR. CHARLES HYMES (Minneapolis) mentioned the case of a boy with interstitial keratitis. The cornea of each of his eyes was very opaque after more than four or five months and the condition seemed stationary. This boy contracted measles and within two weeks the cornea of each eye had cleared up beautifully. This seemed to be an illustration of the beneficial effects of fever therapy in the case under discussion.

DR. H. W. GRANT (St. Paul) stated that Dr. Dennie had experimented with all known types of malaria and had finally found a very satisfactory type which Dr. Grant thought was the quartan type, and that his results were more satisfactory with that than with any other form of treatment.

Dr. Grant said he personally had been using typhoid vaccine, which he thought was very satisfactory and could be a little better controlled. With typhoid injections, he thought there was a possibility of destroying the regeneration of the polymorphonuclear leucocytes, possibly because of the destruction of the bone marrow. Sometimes after typhoid injections there would be a low polymorphonuclear cell count.

DR. HANSEN (in closing) replied to Dr. Morton's question about the dangers, that not much was known in regard to this particular treatment for congenital syphilis, but he did not think there was much danger in a case of this kind. With older patients, those having paresis or tabes, there was considerably more danger. Of course any residual malaria could be taken care of easily. In giving fever treatment, the patient was very apt to develop herpes. At least one case of dendritic keratitis was reported which added to the difficulty that there was with the syphilitic changes. Dr. Hymes' observation that the girl had glaucoma was not unusual. Many of them had a secondary glaucoma, which was not difficult to explain when one considered the pathology, which usually involved not only the cornea, but the iris and ciliary body, pectinate ligament and even retina and choroid. Dr. Hansen said he had been unable to observe any newly-formed vessels in this case; whether that was due to the treatment or whether this was one of the avascular cases that sometimes occurred was not known.

In regard to supplemental treatment in these cases, Dr. Hansen said that the use of malaria seemed to increase the action of other treatment for syphilis. Arsenicals, mercury, or whatever was used, had a much more decisive action after malarial treatment.

W. E. CAMP,
Secretary.

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

March 21, 1932

DR. HILLIARD WOOD, chairman

Bilateral acute uveitis

DR. HILLIARD WOOD presented Mr. J. R., aged forty-five years, who gave the following history: Three months previously he had contracted gonorrheal urethritis. Six weeks following this infection he had developed bilateral iritis with sudden diminution of vision, to perception of light in each eye.

Examination revealed an advanced bilateral acute iritis. The pupils were contracted despite the constant use of one percent solution of atropine. A smear from the urethra showed gonococci. The blood Wassermann was negative.

Dr. Wood was able to dilate the pupils with difficulty by the use of scopolamine, cocaine, and adrenalin, at frequent intervals. There were posterior synechiæ in each eye. The ophthalmoscope showed no fundus reflex whatever in either eye. Infected tonsils had been removed immediately. Under local use of scopolamine and salicylate of

soda, the patient's suffering had been reduced.

Discussion. It was the consensus of opinion that the patient had metastatic endophthalmitis.

Ocular manifestations in a case of cavernous sinus aneurysm

DR. KATE SAVAGE ZERFOSS reported such a case. The patient, M. T., aged thirty years, had been shot in the face, six weeks before he was seen. There had been swelling of the eye-lids on both sides, and diminished vision immediately following the injury. The patient also described persisting roaring noises in the head which had developed one week after the accident.

Examination revealed a marked, nonpulsating exophthalmos on the right side. Vision in this eye was 10/100. The right lower lid presented ectropion; there was chemosis of the lower bulbar conjunctiva. All extraocular muscles except the superior oblique were paralytic. Ptosis of the right upper eyelid and complete internal ophthalmoplegia were present. Fundus examination was negative. There was no pulsation, nor injection of the superficial vessels in the adjacent skin. In the left eye there was slight conjunctival injection, but no chemosis. There was a central posterior cortical cataract approximately 3 mm. in diameter. A bruit was heard over the right side of the head, especially in the temporal region. The Kahn test was plus four; the Wassermann was negative. The blood pressure was 120/80.

The x-ray report was as follows: "Plates of skull made in various directions showed numerous metallic foreign bodies scattered chiefly through the soft tissues over the anterior portion of the skull and facial region. There was evidence of one, and possibly two, small shot having penetrated the cranial cavity, one of these lay just lateral to the right side of the sella turcica, the other lay somewhat lateral and posterior to this. The position of the foreign body lying to the right of the sella turcica could be entirely consistent with the clinical findings. Impression: intracranial and extracranial foreign bodies."

Four days later, ligation of the internal carotid artery was performed by Dr. Barney Brooks. There was left facial paralysis and right hemiplegia immediately following the operation. This disappeared the following day. Four days after the operation there was edema of the optic disc in the right eye, and a diffuse white exudate over the retinal vessels, nasal to the disc.

When the patient was discharged from the hospital the bruit could still be heard. Nine months later it was absent. At this time the vision was 20/50 in each eye. The extraocular muscle balance was orthophoric at this time.

Operations for ectropion had been performed.

H. C. SMITH,
Secretary-Treasurer.

ROYAL SOCIETY OF MEDICINE, LONDON

Section on ophthalmology

February 12, 1932

MR. ELMORE W. BREWERTON, president

Pulsating exophthalmos

MR. WOLFF showed a female patient who had noticed for seven months that her right eye was becoming more prominent. Some months before noting this she knocked her head on the mantelpiece, and since then there had been a gradual diminution of vision, to the accompaniment of pain, especially over the second division of the fifth nerve. The right eye was much proptosed directly forward and pulsated synchronously with the radial pulse. No bruit in the temporal fossa could be made out. With her —2. D. sph. glasses the vision of the right eye was 6/24. The right iris was of lighter color and smaller than the left and it was sluggish in action. In the fundus of the right eye there was some dilatation of retinal veins, with some haziness of the upper margin of the disc. No nasal sinus disease or hypothyroidism seemed present, and the Wassermann reaction was

negative. He thought the condition was a vascular growth.

Discussion. Mr. Ransom Pickard said that the thrill elicited was a very fine vibratory one, the kind met with when there was a communication between two vessels, especially between an artery and a vein. He thought such a communication was present.

Mr. Foster suggested that a tumor might have originated in the thyroid gland. In some cases the only manifestation was a secondary one, and often the thyroid gland was only found to be implicated when autopsy was done.

Cerebral tumor

Mr. MacCallan exhibited the case of a woman who fell on the back of her head in 1925. Ecchymosis of the lids followed. In 1931, she had a fainting attack. The fundi showed no pathological change. Vision in the right eye was 6/18, in the left 6/9. The tonometer showed a tension of 30 mm. in the right eye, 35 mm. in the left. The visual fields showed marked concentric contraction. The blind spots were much enlarged, and their size had increased considerably in the last week. The Wassermann was negative. Radiologically, the sella turcica seemed normal. The sugar metabolism was not disturbed. The neurological examination seemed to indicate a tumor in the pituitary region, as the optic chiasma was involved. The woman had much superficial fat, especially in the pelvic region, this area being very tender. Her weight had increased 20 pounds in 19 days.

Congenital nuclear hypoplasia

Mr. O. Gayer Morgan showed a boy aged eleven years, who had had bilateral facial paralysis, and had been unable to move his eyes laterally since birth. He had other congenital malformations, including webbing of the fingers and talipes equinovarus. As an infant it was difficult to get him to suckle for food, and there had been trouble with salivation. Epiphora had also existed from birth. The boy was now very intelligent and had good vision. His eyes moved downward well, with slight convergence, but there was no lateral movement of either eye separately, or of the two eyes together.

Discussion. Mr. Leslie Paton pointed out that the only way to secure some degree of convergence was by asking the boy to look at his own finger. These were very interesting cases as it was difficult to associate the internal condition of the brain with the other facts.

Pigmented cyst

Miss Rosa Ford showed a girl aged fourteen years, who had a small swelling on the upper part of the right iris, approximately 2 mm. by 3 mm. in size. There was an irregular surface and a little pigment on each side. The swelling overlapped the pupil, but did not reach the iris angle. When she saw the condition a year ago it appeared to be cystic but now it seemed to be more solid. There was no history of injury, not even slight trauma in infancy.

Discussion. Mr. T. Harrison Butler spoke of an identical case of his own, in a woman forty years of age who had noticed the growth for two years. The speaker had watched the growth for a year, and during that time there had not been any alteration in size or appearance. It had been treated by radium at the Radium Institute, and it was now getting smaller, flatter, and losing its defined outline. There seemed little doubt that it was an endothelioma, but as it was not growing he did not feel inclined to interfere. Recently the patient had had a feeling as of a marble in her throat which might mean a secondary growth in the esophagus. He recommended radium for the case presented.

Mr. Mayou spoke of two cases which he had had of pigmented tumor of the iris. One was that of a man with a pigmented nevus, whom the speaker had seen for the first time fifteen years ago. A drawing was made of the nevus, but the man was not treated. Fifteen years afterwards he was seen again, and the tension had then begun to increase and occasionally the vision was misty. The tension seemed to suggest the onset of malignancy so the eye was removed. There was a malignant growth that was

spreading back into the ciliary body. The increased tension was, in his view, very significant.

Dislocated lens which had been in the anterior chamber two years

MISS FORD showed a woman aged seventy-seven years. She had seen the woman ten years ago at which time she had cataract in the right eye. The eye had been blind for fourteen years. Four years ago she had an attack of iritis after which the lens became soluble and was partially absorbed, so that the patient could see large objects. Recurrent iritis persisted for the next two years, with much pain. Just before the lens slipped into the anterior chamber the pain was almost intolerable, but immediately afterwards the pain was much less, and since then the eye had given little trouble. Projection was very poor. She proposed to leave the eye alone.

Secondary carcinoma of the orbit

MRS. MARTIN showed a woman aged sixty-six years, who had had her left breast removed in 1929, and until four months ago had remained free from recurrence. Then she returned to the hospital with the complaint of mistiness of vision. There was early cupping in both discs and increased tension in the left; both pupils were relatively large. Later there was loss of the whole of the nasal field of vision and complete ophthalmoplegia, with ptosis and slight proptosis. Still later she had optic atrophy and no perception of light. A small lump appeared in the upper, inner angle of the orbit. The frontal sinus was clear. She had received eleven exposures of deep x-ray but with little improvement. Infraorbital edema was now present.

Hemangioma of the retina

MR. HEATH showed a girl aged twenty-three years who for eight months had been unable to see anything with the left eye when the gaze was directed straight ahead. The right eye was normal with 6/6 vision. The reactions in the left pupil were more sluggish than those in its fellow, though externally the eye seemed normal.

Discussion. MR. TREACHER COLLINS said this condition was often associated with cerebellar disease, and as it was sometimes familial a watch should be kept on all members of the family. As such cases always ended in blindness, there could be no harm and might be some good in passing an electrolytic needle into the mass.

MR. LESLIE PATON referred particularly to the beading of the artery. In some cases of the kind the associated cranial disease was cerebral, not cerebellar.

Exfoliation of iris stroma

MR. F. JULER showed a patient with this condition. One could see the sphincter muscle standing out naked as a light brown object on a dark brown area. There was no history of trauma in the case. It was doubtful whether this was altogether a congenital anomaly but was probably he thought, atrophy superimposed on a congenital condition.

White deposits in fundus

MR. MALCOLM L. HEPBURN said he had noted a recent tendency to describe cases shown at the meetings that had white or yellowish-white deposits in the fundus as either exudative retinitis or Coats' disease, though there was little reason for them to be so regarded. He hoped by this paper to pave the way to some agreed opinion. The title of this paper was so chosen as to exclude cases with white patches and deposits about which there was no difference of opinion or difficulty of diagnosis, such cases as those with metastatic inflammatory deposits, or of fibrous tissue development, either at the macula or on the retina. The term "exudative retinitis" implied an inflammation of the retina with an exudation of albuminous or hemorrhagic fluid into the layers of the retina, a condition seen only in cases of retinitis due to renal disease, diabetes, and diseases of the retinal vessels. It was not surprising that the exudates in retinitis showed a tendency to

encircle the macula. Since their origin was the retinal vessels their tendency was to accumulate in the vicinity of the larger vessels which surrounded the macula.

He reminded the members of the eight clinical and five pathological points which Coats brought out in his original paper in 1908, which was entitled "Disease of the retina with massive exudate," and said it was only by taking into consideration the accompanying clinical signs and symptoms and then watching, often for a long time, the ophthalmoscopic changes and subsequent behavior of these exudates, that definite conclusions could be arrived at, as to their cause. As the white deposits were widespread, often multiple and ill-defined, he would hesitate to describe a single exudate, with a well-defined border, occurring at the macula, as an example of Coats' disease, however similar the ophthalmoscopic appearance might be.

The most convincing proof was the pathological and histological one, but as opportunity for this was often lacking one had to rely on the clinical evidence.

The reader then gave in review the literature which had appeared on the subject. In the Transactions of the Ophthalmological Society (Vol. XLVIII) Mr. Mayou had reported the pathological details in a case of widespread exudate with a retinal detachment, in which he found that the posterior layers of the retina were adherent to the choroid, the venæ vorticosæ were thrombosed, and the detachment had occurred between the anterior and posterior layers of the retina. He thus proved that the source of the hemorrhage was the choroid.

The type of white deposits which Mr. Hepburn wished to discuss in this paper was that which occurred in the macular region and occupied practically the whole of that area. They often had a well-defined border, were raised above the level of the rest of the fundus, while the retinal vessels showed no visible change in any part of their course, and the disc was normal. There were three varieties of this kind of deposit, new growth, simple serous exudation and blood extravasation, which at certain stages often looked much alike.

The usual aids to the diagnosis of new growth were, the occurrence of a small swelling at an early stage, which gradually increased in size while the patient was under observation, and at a later stage new vessels coursed over the swelling. A detachment of the retina might be discovered at a distance from the tumor which varied in different cases. Sometimes there were deposits of pigment in the vicinity. On the other hand the simple serous exudates and blood extravasations occurred suddenly, attained their maximum size in the early stages, then while under observation, slowly subsided, later undergoing various changes. It was these last two varieties which gave rise to the greatest divergence of opinion, since the changes wrought so much alteration in the ophthalmoscopic appearance. He thought it would be generally agreed that vascular changes of some kind were responsible for the white exudates at the macula.

In studying diseases of the choroid one was struck by the fact that the fundus conditions due to disease of the choroidal blood vessels could be in existence for many years in the presence of quite normal retinal vessels, while in other cases the reverse was the rule. Also, both systems might be involved together in sclerotic changes of their blood vessel walls.

If it could be agreed that massive white exudates of similar appearance took place from either the retinal or the choroidal systems, it would go far towards reconciling the apparently divergent views as to their origin.

His view was that the particular type of white or yellowish-white deposits in the macular region to which he had referred was more likely to be of choroidal than of retinal origin. This diagnosis was supported by the clinical and ophthalmoscopic data in many cases, and therefore should not be confused with Coats' disease. He favored either the term "post-retinal exudate" or "post-retinal hemorrhage," without

committing oneself as to whence the fluid was derived.

(Reported by H. Dickinson.)

COLORADO OPHTHALMOLOGICAL SOCIETY

January 16, 1932

DR. DONALD H. O'ROURKE presiding

Retinitis simulating retinitis pigmentosa

DR. WM. M. BANE presented Mr. E. F. R., aged forty-six years, who had been first seen December 8, 1928. Complaint was inflammation of left eye for three weeks, with photophobia, and blurring of vision. The vision was: right eye, 5/4-1, left eye, 5/20. The cornea of the left eye had been very irregular. The iris was adherent to the lens capsule, the pupil was irregular, the eye was moderately inflamed, and numerous pigment deposits were present on the anterior capsule. After several visits the patient was not seen again. No record of the fundi was made.

He again reported on January 15, 1932, with a history of poor vision especially at night. The left eye was the worse. There had been no similar complaint by any of his family. He was not aware of having night blindness until the past few years. Vision of right eye was 5/6, left eye, 5/20. There were markedly contracted visual fields for 6 mm. white test object.

The left eye showed an adherent iris with old pigment deposits on the anterior capsule. Both eyes showed marked tesselation of fundi with pigment deposits in the retinæ. There was an absence of epithelial pigment, exposing the choroidal system of vessels. There were also some elongated weblike areas exposing the sclera. The optic discs were fairly normal in color and blood supply. His hearing was normal.

Discussion. DR. D. H. O'ROURKE said he had seen a similar picture recently in a child; the blood Wassermann was four plus not only for the patient but also for three other children in the family.

DR. J. M. SHIELDS commented on the frequency of finding independent fundus lesions where one did not expect them, as in foreign bodies of the cornea.

DR. W. A. SEDWICK said it had been his idea that retinitis pigmentosa began in childhood. Dr. Sedwick said he had had several cases where no relative had the disease and there was no consanguinity; he wondered whether that was the experience of other members.

DR. I. E. HIX spoke of the occurrence of five cases of retinitis pigmentosa in three generations on the Dutch island of Curasao where intermarriage had been practiced for years.

DR. WM. C. BANE mentioned seeing three cases of retinitis pigmentosa in one family.

DR. E. M. MARBOURG said he believed this case was one of luetic retinitis. He knew of two deaf mutes in the same family who both had retinitis pigmentosa.

Iritis accompanied by conjunctivitis (?)

DR. WM. M. BANE presented B. B., aged seventeen years, who was first seen January 5, 1932, at which time he gave a history that the right eye had been quite red and the lids adherent with discharge since December 25. He had also had a severe cold. The eye had not been watering, had not been at all painful, no headache had accompanied the trouble with the eye, and there had been no photophobia.

When examined on January 5, most of the redness had disappeared and the discharge had ceased several days previously. It seemed to be a case of simple conjunctivitis that with home treatnent had almost recovered. However, the vision of this eye was 5/10, the other 5/4. There was a suggestion of circumcorneal injection. A disc of homatropin and cocain for diagnosis did not affect the pupil which was round and the same size as the other. Atropin 1 percent or levoglaucosan did not open the pupil. Atropin every four hours and salicylates were ordered. The next day the pupil was almost imperceptibly larger, but no synechiæ were seen. Levoglaucosan was instilled each day, and each day the pupil was a fraction

of a millimeter larger in diameter. By January 11, six days later, the pupil had the size and shape seen when presented (about half dilated) and behind the rim could be seen several posterior synechiæ. Dr. Bane had not been able to dilate the pupil further. The congestion had never been marked. The vision two days before presentation was worse, 5/12—, but today when episcleritis was first seen the vision was 5/6-3. In the extreme periphery of the fundus several small areas of exudate could be seen.

The patient had diabetes and was under treatment with insulin. The teeth and tonsils were apparently not diseased. The case was presented because of the question as to etiology.

Discussion. Dr. Edward Jackson said he did not believe the condition was tuberculous. Diabetes could cause the uveitis, but usually did not give such a vitreous haze. Dr. Jackson remembered having several cases where he had had considerable difficulty in differentiating a conjunctivitis from an iritis.

Dr. Melville Black favored a diagnosis of tuberculosis because of the lack of tenderness, the redness over the muscles, and the irregularity of elevation of the iris. He suggested a tuberculin reaction test.

Dr. S. Goldhammer quoted Magitot as saying that diabetes and tuberculosis were rarely found in the same individual.

Dr. E. R. Neeper suggested the use of dionin.

Iridodialysis

Dr. J. M. Shields presented J. L. H., aged eight years, who had had no eye injuries until December 29, 1931, when a neighbor boy, using an air rifle, shot the patient in the left eye. The only evidence of injury to the lids was an abrasion just below the inner end of the left brow. The anterior chamber was filled with blood and the iris was torn away from the ciliary body nasally and above. There was no sign of a perforating injury to the globe, but the center of the cornea showed marked opacity. No conjunctival injury could be seen.

Dr. Bouslog localized the shot outside of the globe and adjacent to the anterior, inferior quadrant of the sclera; the shot happened to be of steel instead of lead. Because of the location of the shot, Dr. Shields placed a Mueller's magnet probe just below and lateral to the globe, asked the patient to look up and to the right, pulled the lower lid away from the globe and as he did so the shot popped out to the magnet. It had come through a tear in the lower transitional fold. The vision of the injured eye without a lens was now 6/12.

Discussion. Dr. Melville Black said that he was very gratified to know that the manufacturers of air rifles had even shown enough "humanity" to make the missiles out of steel so that the oculist now had a chance with an injured child's eye.

Dr. Edward Jackson referred to the work being done at the Mayo Clinic on lead poisoning in ducks due to the ducks getting the lead shot into their gizards while eating on the bottom of shallow lakes.

Progressive, high myopia

Dr. J. M. Shields presented S. E., a Jew, aged fifty-two years, who had until within the last few years been engaged in the sale of medical books. At the age of twenty-one years this patient had taken about 8 diopters correction; at 23, 10 diopters; at 33, 13 diopters; at 44, 16½ diopters. The correction in January, 1930, was practically the same, with vision of 5/80 O.D. and 2/80 O.S. His eye grounds showed the typical changes found in high myopia. His vision was so low as to make much use of his eyes quite out of the question.

Traumatic, temporary, posterior capsular cataract

Dr. George H. Stine reported further notes on the case of Lee L., aged thirty-three years, whom he presented at the meeting of the Society on May 16, 1931.

This patient was followed until August 30, 1931. During the time of observation the eye remained practically quiet. The vision improved from .08 to

1.1 on the last mentioned date, with a small myopic correction. The patient had accommodation of 8.5 D. in the right eye and 7 D. in the left, reading Jaeger one. The posterior lenticular opacity had cleared almost completely, except for a small, finely powdered area in the center. The opacity had cleared first in a concentric area, the marginal portion then disappeared leaving the small central opacity mentioned above. No fundus pathology could be seen. Dr. Stine felt that this posterior capsular opacity might now be assumed to be due to the traumatic concussion.

Sympathetic ophthalmia

Dr. Wm. M. Bane reported the case of a young man, aged twenty-seven years, who had been injured on November 6, when the broken end of a jack-rod struck the left eye, lacerating the cornea from temporal to nasal limbus, but apparently not entering the region beyond the limbus. The globe was sunken, much of the contents having escaped, and some iris was prolapsed. Conjunctival flaps from above and below were sutured across the cornea. These held in place for five days. The eye had filled up to a remarkable degree. On November 25, the iris was clear above the corneal wound, but the lower part of the anterior chamber was black with blood clot. He had bare light perception. On December 3, the eye was not painful and the tension was about 15 mm. (Schiøtz). December 7, he was told that the chance of useful vision was nil, and that it was believed the eye should be removed for safety to the other eye, although there wasn't the slightest indication of any trouble beginning there. Vision of the right eye was 5/4.

On December 15, enucleation and gold ball implantation was done. Recovery was uneventful. The patient was feeling fine, and was fitted with a glass eye about December 28. On January 7, he came to be seen saying that he had been having pain in the forehead and behind the good eye. The eye was not congested, but the vision was 5/5-2. The pupil dilated easily with ephedrine. A few fine deposits on the lower posterior surface of the cornea were seen. The vitreous seemed clear, but the disc margins were somewhat indistinct. Since he had a painful tooth he was advised to have immediate dental care, and return the next day.

He was not seen until January 14, at which time his mother said that the vision had been hazy for several days. The eye now showed a mild but diffuse ciliary injection, with pupil about 2 mm. wide and slightly irregular. There was an irregular ring of deposit inside the pupil on the anterior capsule. Atropine 1 percent opened the pupil in part, and one drop of levoglaucosan completed the dilatation to the limit. The deposits on Descemet's membrane were much fewer. He was given 15 grains of sodium salicylate intravenously and 20 grains every four hours by mouth, as well as calomel gr. ¼ with soda, and atropine ointment 1 percent, both three times a day.

On January 15 he was given 25 million typhoid vaccine intravenously. No reaction followed.

Dr. Bane said that this was probably a late sympathetic involvement, but that such late involvement was certainly rare. Brownlie and others gave a differential white count which was usually found in these cases, the principal feature of which was an increase in the large mononuclear leucocytes from about 4 to 20 percent. This was not present here. The white count was low, about 4000, but the differential count was normal.

Discussion. Dr. Edward Jackson advised the removal of the teeth, inasmuch as focal infection was one of the theories of the etiology of the disease. He said Key had reported an interesting case of this sort.

Dr. D. H. O'Rourke suggested using autohemotherapy.

Dr. Wm. H. Crisp recommended a light x-ray treatment to the eye and ultraviolet radiation to the body.

Dr. G. H. Stine mentioned that Coley's mixed toxins intramuscularly could be used as a foreign protein and might be of value in this case.

Dr. G. L. Strader said he had had a case in which he had injected 1 to 5000 mercuric cyanide in 5 percent dionin subconjunctivally with good results.

Such treatment had also been recommended to arrest the progress of cataracts.

RALPH W. DANIELSON,
Secretary.

NEW ORLEANS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

Section on ophthalmology

March 17, 1932

DR. CHAS. A. BAHN, president

Optic neuritis with pituitary tumor

DR. EARLE BROWN presented a lady sixty-two years of age, who complained of violent headaches, especially on the left side, shooting pains in both eyes, left earache, equilibrium disturbance and failing vision for the last year. The headaches had existed since early childhood.

Vision in the right eye with correcting lenses was 20/200, left eye 20/50. The fields were contracted about fifty percent for form and color, in both eyes, there being some reentering angles especially in the left eye. There was a bilateral central scotoma. Optic neuritis was present in the right eye, and a slight blurring of the disc margins in the left eye.

Radiographic studies indicated sellar enlargement, with bone destruction anteriorly, also marked thickening of the entire skull. Hyaline and finely granular casts were present in the urine. Changes in the size and shape of the hands and face began in 1927, and had progressed until now. The diagnosis, by the neurologic surgeon who examined this patient, was adenoma of the pituitary.

Discussion. DR. T. J. DIMITRY stated that he had examined this patient in 1927, when no eye symptoms nor field changes were present. The sella was enlarged and acromegal present; surgical intervention had been advised.

DR. HENRY BLUM asked what therapeutic methods were to be instituted, feeling that something should be done at once.

DR. CHAS. A. BAHN said that this patient was of especial interest because optic neuritis with papilledema was rare in persons with pituitary tumors and acromegaly. The fundus findings and the visual fields suggested the possibility of some other causative factor. The ocular condition had existed for at least several months. The defective vision, the formation of new blood vessels, and the beginning degenerative changes about the macula in the right eye, indicated that a secondary atrophy with possible blindness would soon supervene unless preventive measures were promptly taken. A subtemporal decompression on the right side was apparently indicated unless contraindicated by some other causative factor, such as advanced cardiovascular renal disease.

DR. EARLE BROWN (closing) stated that surgical treatment was unquestionably necessary, the method being left to the neurological surgeon.

Recent diagnostic advances

DR. HENRY BLUM mentioned the mercury vapor lamp and fluorescent solutions in corneal microscopy, for determining earlier changes in the anterior segment of the eye. Nerve fiber bundles in the fundus were more distinctly seen with mercury vapor lamp illumination and red-free light.

The so-called empty space behind the lens apparently did not exist and it had been said that there was no hyaline membrane.

Bailliart and Magitot had investigated the pressure in the retinal artery with the ophthalmodynamometer. The reading was considered of value in connection with the average arterial pressure and the intraocular pressure. Thus it was possible to anticipate papilledema, to study the general arterial pressure and the early stages of glaucoma.

Dr. Blum exhibited the new color test of Dr. Polack, which consisted of a complete set of confusion colors, represented by a large number of colored paste board squares which must be properly arranged by the patient in their order of saturation.

MONTE MEYER,
Secretary.

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ECONOMY IN GLASSES

Poor medical advice is the most expensive, especially when it is given "free". This is as true of the getting of glasses as it is of cataract operations. The measurement of the refraction of an eye requires accurate lenses and methods of using them, conscientious attention to details, and repeated tests, until the measurements are accurate. These are impossible to the optometrist whose compensation must come through the sale of glasses; and who must make his sale at the first visit or lose it to some one else. No matter how poor is the patient, he must have skilful conscientious service or he is simply swindled. Worthy members of the medical profession are the only ones who can give such service. The amount they can give is strictly limited; no matter how much they may wish to give of time and effort to the needy.

The optical needs of school children, mechanics, clerks and needle-women, are quite as great as those of captains of industry, or millionaires. Broader optical service for the people must come by willingness of greater numbers of physicians to engage in this service (not an impossible idea in this time of underemployment); and by improved methods of measuring for glasses that will eliminate inferior tests and lead most directly to accurate results. In addition to that, it is reasonable to seek for lower retail prices for glasses in frames, than are now charged; to pay for rent, advertising and getting the customer educated to the latest fashion in spectacles.

Since Donders called attention to the medical aspects of correcting errors of accommodation and refraction, there have been many methods tried and a few chosen, for the accurate measurements of refractive errors. The old plan of bringing out a stock of glasses and letting the patient choose those he likes best, must be wholly discarded, even in the subjective testing with lenses from the trial case. The use of the ophthalmoscope tells so much at a glance, that the practiced user of it can know more of the eye he is testing in one minute,

than the old methods could tell him in an hour.

Skiascopy has made it possible to measure the refraction more accurately in a few minutes, than it was to learn it in as many hours, by all the methods that had been used previous to its introduction. The cross cylinder held before the eye is a method of subjective testing. But rightly used it is a method of scientific exactness that can be given the certainty of any objective method. When by these methods the error of refraction has been measured, the trial lenses and test letters may be used as an independent test to confirm or correct the results obtained by other methods.

In general, accuracy is to be reached by repeating the tests, starting on the base of the approximate correction previously determined. For people that are amblyopic, stupid or ignorant, skiascopy is of the greatest importance and should always be used first for children. On its findings all other tests should be based. For most children cycloplegia is essential; for young children with atropine, or one of the other natural cycloplegic alkaloids; for school children in the upper grades, homatropine will usually be sufficient.

For elderly people intelligent, and accustomed to reading and observing accurately, the cross cylinder can be used as soon as the ophthalmoscope has shown the approximate spherical correction and the vision that the eye can be expected to get with glasses. It must be used with an understanding of what allowances are to be made for the patient's psychology.

The proper way of making tests of ocular refraction must be learned by intelligent practice, but every clinic offers a superabundance of refraction cases. The student who starts by learning about everything he is told to do, and the determination to correct each eye as accurately as possible, no matter how long it takes to do it in the early cases, may expect in a reasonable time to become proficient in rendering such service. The man who learns to correct errors of refraction in this way may be sure of demand for his skill in any civilized community; and also sure that the demand for his help will last as long as he will be able to give it.

Edward Jackson.

THE LIGHTING PROBLEM

Our ancestors may have experienced physical inconvenience in relation to the lighting problem, but until the end of the eighteenth century they seem hardly to have devoted much mental effort to its solution. Lamps were popular vehicles for artistic expression, but for thousands of years they remained consistently crude as to their efficiency in the production of light.

With animal fat or vegetable oil as the source of illumination, and a wick composed of moss or twisted vegetable fiber, the receptacle was at first readily afforded by a hollow piece of rock, a seashell, or even the skull of an animal. In the history of applied art, few objects are more interesting and attractive in their variety and beauty of design than the lamps of early civilization, from the baked earth of the Assyrian to the copper handiwork of the Etruscans, Greeks, and Romans.

But the combustion in these early lamps was wasteful, dirty, irritating, and odoriferous. To think of an ancient torch is to form a mental picture of flame accompanied by great volumes of smoke, soot, and falling grease. Even the silver candelabra enjoyed by the wealthy citizen of early colonial days shed a flickering and uncertain light.

In 1783 Legers of Paris invented the flat wick, woven like a ribbon, and enclosed it in a support which regulated the area exposed to combustion. In the same year Argand, the Swiss chemist, designed the tubular burner which extended down through the oil reservoir, created a central air current, and avoided the escape of unburned smoke and soot.

Since the days of Legers and Argand one improvement has succeeded another. After the introduction of kerosene or coal oil ("paraffin oil" as it is called in Great Britain) and illuminating gas, better combustion with in-

creased illumination and reduction of heat was favored by such devices as the incandescent mantle.

Much of the literary and scientific work of earlier days was accomplished by the modest light of the candle; and if we were to believe the exaggerated statements of some modern commercial organizations, we should have to suppose that the eyes of many of our forbears were more or less completely ruined by dependence upon that primitive illuminant. As a matter of fact it is likely that eyes of normal refraction were seldom much the worse for work done by candlelight, although the relative positions of candle and book must usually have produced the disagreeable light reflections so much discussed today, as well as providing what we should now consider a very inadequate amount of illumination.

The eye is a highly adaptable organ, and Nature has conferred upon us the privilege of seeing well under extremely variable intensities of illumination. Daylight itself varies greatly in amount and diffuseness. It would be supposed as a matter of course that the greatest efficiency in all activities dependent upon vision would be associated with the use of good daylight illumination; yet experimentation has demonstrated that practically maximum working efficiency may be had with artificial lighting which falls far short of the daylight standard.

The new generation is almost unacquainted with any other form of artificial illumination than that of the electric lamp; and like among the producers and the consumers of electricity the constant tendency is to use lighting systems whose intensity approaches more and more nearly to that of daylight. Particularly on the part of the producer of electric current, who is interested in the greatest possible consumption of his product, and on the part of industrial organizations who are concerned in the highest possible efficiency of their employees, there has been eager consideration of the kind and quantity of light most desirable for various purposes.

A further problem of hygienic interest to the consumer of electric light, but not without distinct commercial value to the purveyor of this commodity, is related to the existence of the phenomenon known as glare. Glare may be defined as an inequality of stimulus produced partly by inequality of illumination, and partly by the impact upon the retina of strong light which is not utilized in increased definition of the details under observation.

The bases upon which inadequate illumination on the one hand, and glare from improper distribution of illumination upon the other hand, produce undesirable symptoms are not clearly understood, and have been subjected to much debate. Very careful study from the point of view of the practicing ophthalmologist has been devoted to these subjects by Lancaster (Archives of Ophthalmology, 1932, volume 8, page 1; and American Journal of Ophthalmology, 1932, volume 15, page 783).

It is obvious that much of the work of the world was formerly done, and that much work is still being done, with amounts of illumination which according to present scientific or practical standards would be considered inadequate. Nevertheless disregarding the appreciable but not always considerable reduction in efficiency caused by such scanty illumination, it may be stated in the majority of healthy individuals, and especially in the absence of important refractive error, the use of very scanty means of illumination for work involving precise and intensive use of the eyes has been and is commonly tolerated without apparent production of disturbing symptoms.

It is also true that many of the activities of life are carried on under visual conditions which include important amounts of glare, yet without apparent interference with the ocular or general health of the individual concerned. Many people make little or no complaint of the effect produced by outdoor activities, such as mountaineering, motoring, fishing, and travel and sport upon the water, which involve a great deal of glare in the sense that light, not utilized in securing better definition of the detail observed, is strongly reflected into the eyes. In this connection it is important to remember that many pa-

tients who have previously complained of excessive or faultily distributed light cease to experience much inconvenience from these sources as soon as they are given a proper refractive correction.

Some tasks, for greatest efficiency, even seek lighting which is accompanied by glare. Thus the worker at a sewing machine faces the light to obtain the most satisfactory definition. A position opposite the source of light, by intensifying the contrasts between high lights and shadows, throws into strong relief the texture of fabrics and the thread used for making or repairing. The ophthalmic surgeon himself exemplifies the same phenomenon, for it is possible to execute more accurately the steps of a cataract or other intraocular operation when the light shines obliquely from the side opposite to the surgeon than with any other lighting arrangement.

For reading and similar purposes Lancaster favors the use of brilliant but evenly distributed room illumination rather than light directed especially upon the work or the printed page while the rest of the room is in relative darkness. It is fairly obvious that when the worker must direct his gaze to a number of different objects over a wide field and at varying distances from the eyes, he will act most efficiently with brilliant and evenly distributed illumination. On the other hand, when the gaze is steadily applied to a very limited area such as the printed page, many workers find the greatest ease of mental concentration and the least accommodative strain with predominantly local rather than general lighting. One of the bugbears of modern life, the telephone directory is often more easily read with a tiny flash light brought close to the print than with indirect lighting of generous quantity. As to mental concentration and the use of the accommodation there must be a distinct value in rather sharp contrast between the light falling upon the detail directly under observation and the general lighting of the room; and, even in a room well illuminated by actual daylight, the careful reader of a manuscript or printer's proof may find greater facility by the added use of an electric globe within two or three feet of his work.

By any system of lighting some glare and some inequality of illumination are inevitable, as may be readily demonstrated by studying the local high lights and inequalities of lighting in a photograph of any interior under any condition of illumination. The light reflected from different portions of the same sheet of paper or printed page is never entirely uniform as the eye travels from one part to another.

Some of the disturbance due to glare may be attributed to fixity of gaze, in which any excessive local stimulus or glare falls persistently upon the same area of the retina. It has been argued that the narrow printed column such as is used in the American Journal of Ophthalmology is superior to the single-column page used in many magazines, the reason given being that the eye does not have to jump so far in traveling from line to line. Yet any advantage as to fatigue of ocular movement thus accomplished may be more than counterbalanced by lack of variety in the light stimulus during perusal of different parts of the printed page; for it is manifest that when the eye travels across the whole page instead of across a narrow column any inequalities of illumination will be distributed alternately over wider areas of the retina.

W. H. Crisp.

THE ACADEMY

September has gone and the 1932 meeting of the American Academy of Ophthalmology and Otolaryngology has passed into history. But there were several phases of activities of the Society which came to the foreground in this meeting that deserve more than passing mention. The parent program was composed of papers of unusual worth, the majority of which elicited discussion of constructive nature. The instruction program was of essentially the same character as in former years, but contained many new subjects and introduced to the Academy members new teachers, some of whom were given

the accolade after the first hour. But these phases of Academic activity will be dealt with elsewhere.

One whole evening was devoted to the newly formed "Teachers Section". The activities of that section were confined this year to the undergraduate teaching of ophthalmology and otolaryngology. Some eight months previous to the meeting a carefully devised questionnaire was sent to all Class A medical schools and from the replies received, special committees of the Academy analyzed the undergraduate teaching of of these specialties as they are now conducted in the United States and Canada. Enormous variations were found both as to requirements, character of teaching, and amount of time given. The committee recommended for the minimum requirements of undergraduate teaching in ophthalmology the following:

1. Ophthalmology should be a compulsory subject in both didactic and clinical phases.

2. The undergraduate course in ophthalmology should embrace fifty actual hours as a minimum, which should be given during the Junior and Senior years, divided into fifteen didactic hours and thirty-five clinical hours, in which the student examines patients in the out-patient department.

Both of the committees were united in recommending that new instructors should be accepted only after certification by the American Board of Ophthalmology or of Otolaryngology.

On the whole this coincides fairly closely with a report of a similar committee of the American Ophthalmological Society, headed by Dr. Gordon Byers, and adopted in June, 1924. The report of the Academy was somewhat more extensive and offered somewhat more concrete suggestions than did the earlier report. It is the intention that this report be sent to the deans of all class A medical colleges and their answers analyzed and given to the Academy next year.

The other activity of the Academy in a radically new direction consisted in the development of a "Booking Office", known as the Committee on Extramural Instruction. The purpose of this bureau is to assist recognized schools or organized medical societies in the development of courses of medical instruction within their own precincts. To this end the Committee sent inquiries to two hundred and fifty of the leading eye, ear, nose, and throat specialists of this country and Canada and from the answers received have developed a list of specialists who are available for giving local courses and who have prepared themselves upon some one phase of their own subject to the fullest extent. Thus if the University of X desires to stage a two weeks' course for eye, ear, nose, and throat specialists of their own state, the Academy committee will be called upon to form a list of teachers upon the desired subjects according to ability, geographic location and availability. The Academy does not become involved financially in any such course and merely acts in an advisory and assisting capacity. *Harry S. Gradle.*

REFRACTION AND CHROMATIC ABERRATION OF THE EYE

In determining the state of refraction of the human eye, it is not the practice to consider the color of the test-chart. Using a white card and black lettering, with the correction before the eye, we consider that the test-type is focused on the retina. More accurately and to a practical degree, this is not exact because the eye is highly aberrated for colors, there being a value of 1.8 diopters (Helmholtz) between the two ends of the visible spectrum. Other workers have computed this figure to be as high as three diopters.

For determining index of refraction, lens power, and other optical measurements, a single color is used. Unless otherwise stated, optical apparatus has been measured by using the Codium D line as a standard wave-length, and since the chromatic aberration of the eye is high, we, as refractionists are overlooking an interesting and practical phenomenon in not thinking in terms of the chromatic aberration of the eye.

Transposed into a linear expression, Helmholtz' figure cited above, means that with an eye made emmetropic for red, the far point for blue lies just slightly more than one-half meter in front of the eye. Realizing this, one can appreciate the importance of "chromatic accommodation", and although this need not alter our conception of the mechanism of ciliary accommodation, certainly it suggests that vision (focusing) other than that immediately before us, may be accomplished without the aid of the ciliary body. Our knowledge must be broadened to include what is known of chromatic accommodation, and studies and measurements on ciliary accommodation will have to be revised.

To appreciate more fully ocular chromatic aberration we may mention the duochrome method of refraction, lately developed by Pech, J. (Arch. d'Opht., 1930, June), Imbert, René (La Chromoptometrie, Lyon, 1929), and described recently in this Journal by Milton Jacobs (v. 15, 1932, April). The Frenchmen, using monochromatic red and blue screens placed fifty-six inches before an emmetropic eye (emmetropic for yellow) found the eye to be myopic for the blue and hyperopic for the red. Letters on the two screens will therefore appear alike. A weak plus lens will place the red focus nearer the retina, while at the same time, in moving the blue focus also forward, the blue screen becomes more blurred. Hence the test is a highly critical one. An eye for examination is corrected with lenses so that the two images are alike, it being then known that the two foci lie at equal distances from the retina: the midpoint of the spectrum (yellow) would fall exactly on the retina and the eye be emmetropic for that color.

It is not to be argued that the eye should necessarily be corrected to the yellow, even though theory might suggest it. The eye is more than just an optical instrument, and in the prescription for the pair of eyes one must often take into account other factors before deciding upon the strength of sphere that will afford comfort. Furthermore our vision lies chiefly within infinity, and so it may be reasoned that if the eye is made emmetropic for red, the maximal benefit of the chromatic accommodation will be effective and therefore the call on ciliary accommodation be reduced to a minimum.

Information gained by this method of refraction has been valuable to the writer. Acquaintance with the subject affords a clearer visualization of the optics of seeing and it is urged that this physiological optical concept be in daily use on the trial-range.

H. Rommel Hildreth.

PROLONGED OCCLUSION TEST FOR HYPERPHORIA

Probably ninety-five percent of ophthalmologists are engaged in so-called private practice. A few of them may have other major ophthalmic interests, such as research, teaching, administration or the like, but the majority find their financial mainstay and their greatest happiness in the treatment of their office patients. Of this work more than half will be devoted to the alleviation of eye-strain. It therefore behooves each eye physician to make whatever examinations will throw light on the ocular muscles, but the exigencies of both patient's and physician's time demand that no unnecessary tests be made.

For many years the importance of muscle balance and muscle power has received great consideration but the subject is far from closed and much water must still pass under the bridge before the matter is ended. At present there are numerous instruments on the market for exercising the ocular muscles. The eyes are diverged and converged and rotated three or four times a week for ten or fifteen minutes at a time and great results are claimed by enthusiastic doctors. Perhaps these benefits do occur but results in this field are so largely subjective that it is hard to evaluate precisely the part played by the exercises themselves. Great cures can be made where there is great faith. Witness the mute testimony of the heaped-up crutches at the shrine of Father André in Montreal and at other churches the world over. But how can

we differentiate faith and works. Perhaps this is not necessary, but faith cures are not exactly in line with the scientific training of the ophthalmologist who would prefer to deal with more tangible things. Possibly someone will come to the scientific defense of these instruments by presenting the results in muscle-power increase or improvement of the static condition of the eyes, in a large series of cases after a considerable use of exercises with them. So long as their virtue depends on subjective improvement it will be hard to convince the bulk of the profession of their value.

Another subject related to muscles about which the journal would welcome a contribution would be on cases illustrating the development of single binocular vision in children who have had an amblyopic eye. Textbooks and individual authors state that this is readily accomplished but many ophthalmologists have little success with it. The detailed chronological record of the development of single binocular vision in fifteen or twenty illustrative cases from the records of some ophthalmologist, in which the exact treatment and results in each case were outlined, would be a truly helpful contribution.

One of the muscle tests proposed some years ago was that of prolonged occlusion of one eye (Marlow, F. W., Amer. Jour. Ophth., 1921, v. 4, p. 238.) in order to determine latent hyperphoria. Many oculists who followed this suggestion became enthusiastic as they felt that they often uncovered a latent hyperphoria which escaped them by any other method. Prisms were ordered and some patients were made more comfortable. Undoubtedly prisms are very beneficial in reducing the symptoms of hyperphoria but it is remarkable how much vertical imbalance can be tolerated by some patients without discomfort. The prolonged occlusion test was a trying one for the patient and many ophthalmologists never used it because of this, waiting to note whether it would be accepted by the majority of the profession before employing it.

A definite criticism of the test was made by Abraham (Amer. Jour. Ophth., 1931, v. 14, p. 656.) who suggested that the test did not measure latent hyperphoria but was an expression of Bell's phenomenon which was a protective reflex. Forty-eight patients who were examined showed a hyperphoria of the *occluded* eye, in practically every case.

In this issue of the Journal will be found a paper by Beisbarth (p. 1013) in which the author has reviewed twenty-nine of his cases in which the test had been made. The findings entirely corroborate those of Abraham so it would appear from the work of these two authors that as a measure of static hyperphoria prolonged monocular occlusion is of doubtful value. Another point of view from which these cases might have been advantageously studied would have been to tabulate the hyperphoria a few weeks after the wearing of prisms, prescribed on the basis of the prolonged monocular occlusion test. If the hyperphoria was then over-corrected this would be a further corroboration of the fallacy of the test, because it is generally agreed that the mere correction of a hyperphoria by prisms will rarely, if ever, cure the muscle imbalance.

Lawrence T. Post.

BOOK NOTICES

Manual práctico de oftalmología (Practical manual of ophthalmology). By Dr. Raúl Argañaraz, titular professor of ophthalmology in the faculty of medicine of Buenos Aires. Octavo, heavy paper covers, 705 pages, enameled paper, 588 illustrations (many in colors) in the text. Published by "El Ateneo", Buenos Aires, 1932. (Price not stated.)

This is the second edition of the volume which, under a slightly different title, was reviewed in the American Journal of Ophthalmology for September, 1929. In that earlier review will be found some references to the antiquity and personnel of the chair of ophthalmology in Buenos Aires, at present so worthily occupied by the author of this volume.

If the advance of civilization in a city and a country may be measured by excellence of technical publications, Argentine and its capital must rank very

high. It is doubtful whether any work on ophthalmology has ever been issued more elegantly than Professor Arganaraz' practical manual. Its very numerous illustrations, many of them in several colors, are all beautifully reproduced. None is on a separate plate, but all are inserted in the text and, with amazing accuracy, in close proximity to the descriptions to which they relate.

The volume has an intimate personal quality of directness and simplicity of statement, with emphasis upon details such as are most valuable in daily clinical or private practice.

As an example of the care with which the various chapters have been prepared may be mentioned the six instructive diagrams on visual, sensory, and motor tracts and centers which are contained in lesson twenty-two, on diagnosis of diseases of the nervous system and other organs by pupillary symptoms. The chapter on the crystalline lens carries excellent discriptions and illustrations of the technic of injection of novocaine in the parotid region and behind the eyeball, and of a variety of details in the modern technic of cataract extraction. In no way inconsistent with the practical purpose of the volume is the fact that recent methods for treatment of detachment of the retina are touched upon rather briefly, although clearly; for in a volume of this kind it is manifestly impracticable to deal in great detail with the location of retinal tears, an extremely specialized specialty within a specialty.

For those who read Spanish and for any teachers or students of opthalmology who desire to enrich their store of excellent illustrations of the subject, as well as for those who delight in fine specimens of the typographic art, this volume is most highly to be recommended. *W. H. Crisp.*

Textbook of Ophthalmology. By W. Stewart Duke-Elder, M.D., F.R.C.S. Surgeon, Royal London Ophthalmic Hospital. Cloth, Crown Quarto 1124 pages, 1022 illustrations, 7 colored plates. Henry Kimpton, London, 1932.

This volume shows the growth of ophthalmology. It is larger than the last edition of the book of deSchweinitz, or the textbook of Fuchs, as translated and edited by Duane; but this is only the first of three volumes that are to include the whole work. This opening volume includes: The Development, Form and Function of the Visual Apparatus. Volume II will take up the Deformities, Injuries and Diseases of the Eyeball; while Volume III will discuss Ocular Adnexa, Refraction and Motor Anomalies, Ophthalmological Aspects of General Medicine, Diseases of the Central Nervous System, Physical Therapy and Operative Ophthalmic Surgery.

This volume gives eight sections: I, The Phylogeny of the Visual Apparatus, starts with phototropism, and carries it to the cerebral eye of vertebrates. II, Anatomy and Comparative Anatomy, has chapters on the Anatomy of the Eye, Orbit, The Ocular Adnexa and the Central Nervous Mechanism of Vision. Section III has chapters on: Embryology, The Ocular Pigment and Heredity. Section IV includes The Vascular Circulation, The Metabolism of the Eye, The Intraocular Pressure, The Intraocular Musculature and Movements of the Eyes, and the Protective Mechanism. Section V, Optics, has chapters on: Physical Optics, Geometrical Optics, Physiological Optics, The Illumination of the Eye, Entoptic Imagery and Biological Optics. Section VI, The Physico-chemistry of Vision deals with the Action of Visible Light on the Retina. Section VII, The Physiology of Vision takes up The Stimulus, Visual Sensations, the Physiological Effects of Stimulation, Anomalies of the Visual Senses and Theories of Vision. Section VIII, The Psychology of Vision has one Chapter, XXVII, on Visual Perceptions.

The striking thing about this book is the enormous amount of work that has been done upon it. A great number of new topics have been discussed in ophthalmic journals in the last few years, and many of them that have not been mentioned, much less adequately described, in any textbook on ophthalmology, are given in this volume. We

are reminded of Sir John Parsons' wonderful work "The Pathology of the Eye", by the great number of journal articles referred to in the text and in the bibliographies, which are appended to every topic in the chapters. Not only have original articles been searched out, and studied but there has been a selection of their most important points, which are briefly but clearly set down. Where there is controversy, each view has been set forth with the author's judgment; often when it was simply that neither view had been established.

Almost as striking as the bibliographies, are the cross reference notes, at the foot of each page, which enable the reader to turn at once to the related ideas, set forth elsewhere, without waste of space by repetition. The work might be called encyclopedic, but its arrangement in natural logical order, removes it as far as possible from the brief, pigeonhole, patchwork plan, of an encyclopedia; while the cross references render alphabetical arrangement of topics quite unnecessary for reference purposes. Still more exceptional in books on ophthalmology—almost unknown, except in some published by a few American, or British firms, is the full index of 38 double column pages. This gives all the advantages for reference, that can be afforded by the alphabetic arrangement of an encyclopedia or dictionary.

The book has been printed on highly finished paper. This is necessary for the best reproduction of the many halftone pictures it contains. But the regular reflection from its surface will compel the ophthalmologist to adopt the plan he often advises to patients; to arrange the position of book and source of light, so that such reflection will not be thrown in his eyes. Any inconvenience on this account will be compensated by the splendid photographic portraits of some of the great leaders in modern ophthalmic science: Bowman in the chapter on anatomy, Gregor Mendel and Edward Nettleship with that on heredity, Leber with metabolism, Donders with accommodation and movements of the eyes, and Helmholtz and Gullstrand with optical imagery. In the chapter on embryology the reproductions from the recent book of Ida C. Mann, and the other atlases on the developments of the eye, must be counted to the credit of the plan of photographic reproductions.

The price of a great book like this must be high; and to the publisher's three guineas, American readers must add the tariff, by which a paternal government penalizes the reader who indulges a liking for world science. But for the ground it covers, this book has practically the value of a whole library. It should be found in every library that purports to contain books on ophthalmology. *Edward Jackson.*

CORRESPONDENCE

Notes on history of ophthalmology in Spain

Apropos of Dr. Crisp's recent editorial on Medical South America I wish to share with those who plan to attend the next International Congress at Madrid some notes gathered by me in preparation for my own visit. Spanish is not so widely read as French or German, and the history of Spain, medical and other, is not too well known. The contributions of Arabic, Jewish and Christian physicians of the Iberian Peninsula to medicine, their influence on the establishment of the School of Montpellier, during the middle ages and the Renaissance, is general medical history. Garcia del Real's Historia de la Medicina en España deals meagerly with the history of ophthalmology. Hirchberg's Geschichte der Augenheilkunde is more complete but not up to date. The history of Spanish ophthalmology goes back as far as the thirteenth century, when Petrus Hispanus, afterwards Pope John XXI, according to Walsh in "Popes and Science," wrote a treatise on "Diseases of the Eyes." Garcia del Real mentions a Jewish physician operating on King Juan of Aragon (fourteenth century) for a double cataract, and, during the Siglo de Oro (Golden Age) of Spanish civilization—the sixteenth and seventeenth centuries—a Historia del Ojo (a treatise on the eye) by Bartolomé Hidalgo de Aguero, a De Sensibus Ex-

ternis by Luis Mercado, and a treatise on the use of spectacles (El Uso de los Anteojos) by Daza. With the decline of Spanish culture in the seventeenth century, little is noted of the cultivation of ophthalmology.

By the middle of the eighteenth century we find the Medical School of Cadiz sending six of its best students abroad to study ophthalmology, among them Vidal, Nadal, and Gimbernat who later practice this specialty. The first eye dispensary was established at Cadiz in 1830 by España and Sola. The first textbook on ophthalmology was written by Santana in 1850. The Instituto Oftalmico of Madrid was established in 1857 with Delgado Jugo, a pupil of Desmarres, as its first director. Cervera and Cayetano del Toro are also counted among the founders of Spanish ophthalmology. On the whole however, science lagged in the nineteenth century in Spain. It was a troublous period for Spain with the Napoleonic invasion, the Carlist wars, revolution, loss of most of its colonies, and war with the United States.

Of the twentieth century Spanish contributions, Fielding H. Garrison, in his admirable Epitome of the History of Spanish Medicine, writes in the August, 1931, Bulletin of the New York Academy of Medicine:

> The impersonal scientific contributions of such men as Cajal, Achucarro, Hortega, Tapia, and Barraquer have gone far to lift Spanish medicine out of the same tedious provincialism which once obsessed the medical literature of our own country, and prelude, let us hope, the dawn of a fairer day for Spanish medicine.

Three of the five names mentioned by Garrison have made notable contributions to ophthalmology.

The year 1901 marks the establishment of the "Sociedad Hispano-Americana de Oftalmologia", and the beginning of the publication of the "Archivos de Oftalmologia Hispano Americanos" now in its thirty-second year. In looking over these Archivos, certain names recur again and again: Arruga, Blanco, Castresana, Castillo, Cuevas, Marquez, Mejia, Rema, and more recently, Barraquer, Balbuena, Lacarrere, Lopez Enriquez, Palomar de la Torre, Perez Bufil, Poyales, Soria. Many of them were active contributors to the last International Conference of Ophthalmology, and their names are of course known to readers of ophthalmological literature.

Cajal's contribution to ophthalmology, better known to histologists than to ophthalmologists, should be further dwelt upon. On reading Ramón y Cajal's "Recuerdos de mi Vida," which is in its second edition, one is struck by his fascination for the retina. It was his first love to which he returned again and again in the course of his scientific career. The function of the retina in our development loomed very large to him. Of his birthplace, Petilla, he speaks as "the place where nature pierced my retina and awakened my brain". Needless to say, he considered himself a "visual", explaining thus his early artistic inclinations toward the graphic arts, his curiosity about optics, and his devotion to photography, all of which so seriously interfered with his studies that his father took him away from school and apprenticed him to a shoemaker. These interests stood him in good stead however in his later activities as a microscopist and histologist, enabling him to do his own illustrating. A mere enumeration of his contributions to the histology of the eye and the physiology of vision: his law of dynamic and axipetal polarization, his discovery of association spongioblasts, of centrifugal nerves (nervi-nervorum) in retina and optic nerve, his researches on the structure of the optic chiasm and its decussation, and his studies of the visual cortex—indicates sufficiently to what extent ophthalmology is indebted to Ramón y Cajal. As a teacher he set out to correlate anatomy and physiology, creating "animated anatomy". It is interesting to note that as late as 1875 histology was disdainfully referred to by medical teachers in Spain as "celestial anatomy" and that microscopes served mainly as decorations.

Among his pupils the name of Rio Hortega, the discoverer of phagocytic

microglia and oligodendroglia in retina and optic nerve, is also better known probably to histologists than to clinicians. Cajal refers with sadness to the promising research workers among his pupils who became lost in what he calls "los desiertos de la clinica" (the wilderness of private practice). Among these however, Marquez, the Professor of Ophthalmology at the University of Madrid, and the President of the next Congress, has enriched our knowledge of cylinder skiascopy, binocular vision, decussation of the motor nerves of the eye, and surgery of the eye.

Cajal's autobiography is not only a record of his life and scientific achievements, but is a cultural and medical history of Spain for the past half century. Because of its excellent prose, the first part is available, for those who cultivate Spanish, as an annotated Spanish reader. There is also a book of aphorisms translated by Garrison in the June, 1929, Bulletin of the New York Academy of Medicine in his article devoted to Cajal. Needless to say, Cajal was one of the regenerators of the generation of '98, which marks the awakening of a new nationalism, and stock-taking of the spiritual resources of Spain by the Spanish intellectuals following the debacle of the Spanish-American War. Cajal's voyages abroad, to receive the Nobel prize, to lecture at Oxford and in the United States, and his impressions of foreign countries, make up many delightful pages. He is in his eighty-first year now, and all will agree with Garrison who says: "In solid performance Ramón y Cajal is the greatest figure in the history of Spanish medicine, in point of character the most eminent man his country has produced in several centuries". *M. Davidson.*

ABSTRACT DEPARTMENT

EDITED BY DR. WILLIAM H. CRISP

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

1. General methods of diagnosis
2. Therapeutics and operations
3. Physiologic optics, refraction, and color vision
4. Ocular movements
5. Conjunctiva
6. Cornea and sclera
7. Uveal tract, sympathetic disease, and aqueous humor
8. Glaucoma and ocular tension
9. Crystalline lens
10. Retina and vitreous
11. Optic nerve and toxic amblyopias
12. Visual tracts and centers
13. Eyeball and orbit
14. Eyelids and lacrimal apparatus
15. Tumors
16. Injuries
17. Systemic diseases and parasites
18. Hygiene, sociology, education, and history
19. Anatomy and embryology

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5. CONJUNCTIVA

Ranganatha Rao, B. R. **A note on the seasonal prevalence of catarrhal ophthalmia in Bangalore.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 62.

The author reports his studies of 1000 cases of acute catarrhal conjunctivitis, which in Bangalore occurs in the epidemic form during the period from May to September. The disease is fairly common all the year, but in these months it attains epidemic proportions. The organisms found are mostly Koch-Weeks, pneumococcus, and streptococcus. The Koch-Weeks bacilli are found in about sixty percent of the cases, especially in the early stages. Though the epidemic may be started by the agency of flies and gnats carrying infection from the diseased to the sound, yet the majority of cases during the height of the epidemic are due to direct transmission between the members of a family. Prevention of spread of infection in the family by individual hygiene seems to be even more imperative than the public health measures against flies and other transmitting agents.

M. E. Marcove.

Sédan, Jean. **Trachoma in the tuberculous.** Rev. Internat. du Trachôme, 1932, v. 9, July, p. 138.

Sédan reviews the literature concerning trachoma and its possible relationship to tuberculosis. The majority of authors seem to admit that trachoma is rare among tuberculous individuals and some state the belief that a definite antagonism exists between the two diseases. On the other hand a few authors believe that tuberculosis definitely predisposes to trachoma.

Sédan states that while corneal complications are almost the rule in the trachomatous of Marseilles, he has never noted such a complication in any of the mixed cases of trachoma and tuberculosis observed by him over a period of years. He cites two cases in which tuberculosis supervened in patients having a severe and resistant trachoma, and in which the trachoma healed coincidently with the onset of tuberculous activity.

Phillips Thygeson.

Strebel, J. **Causal or desensitizing treatment of pollen allergy with the pollysat method, and its results during the last ten years.** Klin. M. f. Augenh., 1932, v. 89, July, p. 65.

Experience has shown that the symptomatic treatment of hay fever and conjunctivitis has failed and that only causal therapy can be effectual. Strebel discusses these questions in detail and

reports his favorable results with pollysat, a dialysate of the specific pollen, either in injections or internally. Out of forty patients treated with pollysat twenty-one percent were entirely free in the next year. *C. Zimmermann.*

Zauli, G. **Ultraviolet rays in the treatment of tuberculous conjunctivitis.** Lettura Oft., 1932, May, p. 219.

Three cases of tuberculous conjunctivitis, two of which showed tubercle bacilli in the secretions, were treated with the quartz mercury-vapor lamp of Bach. In two cases prompt cure followed local treatment at 15 cm. of from two to fifteen minutes duration and at intervals of from one to three days. Deleterious effects of the rays on the lens and retina need not be feared.
F. M. Crage.

6. CORNEA AND SCLERA

Ariani, Paulo. **Tuberculous sclerokeratitis.** Arquivos do Instituto Penido Burnier, 1932, v. 1, March, pp. 74-79.

Three cases are reported, in women of eighteen, twenty-eight, and sixty years respectively. In the first case the ocular condition coexisted with lupus in the nose. In the first two cases rapid improvement was obtained under tuberculin treatment. In the third case the diagnosis was based upon the skin reaction and roentgenologic examination.
W. H. Crisp.

De Andrade, Cesario. **Rare forms of ocular leishmaniosis.** Rev. de Ophth. de São Paulo, 1932, v. 1, March, pp. 217-222.

The polymorphic aspects of this disease may create doubt as to diagnosis, especially when the cornea is affected. In addition to the ulcerative form, there may be a keratitis without loss of substance, and with diffuse infiltration simulating interstitial keratitis due to hereditary syphilis. Such a case is described, in which the diagnosis was partly based upon related lesions in the nose and on the back and legs. The author regards the corneal lesions as due to actual presence of the parasite in the corneal parenchyma. Other cases are reported involving the cornea and the eyelid. Ulcerations of the lid conjunctiva may sometimes assume a malignantly ulcerative character of rapid development, followed by permanent deformity. The resistant cases may require mixed treatment with tartar emetic in association with the arsenicals; and massive doses of ultraviolet radiation may accelerate the process of cicatrization. (The author consistently misspells the word "leishmaniosis", being evidently under the impression that the discoverer of the disease was a German.) *W. H. Crisp.*

Glimstedt, G. **Therapy of serpiginous ulcer from a bacteriological standpoint.** Acta Ophth., 1932, v. 10, p. 291.

Optochin is specific for the pneumococcus, and zinc for the Morax-Axenfeld bacillus. In addition to symtomatic measures such as heat, atropin, and cautery, the author lays stress on the eradication of infection in the lacrimal apparatus and of septic foci in the teeth. The use of Besredka antivirus is discussed at length, without reaching a definite conclusion. *Ray K. Daily.*

Goldfeder, A. E. **Cataract extraction in keratoconus.** Zeit. f. Augenh., 1932, v. 77, June, p. 350. (See Section 9, Crystalline lens.)

Grigori, L., and Dumitru, L. **Contribution to the evolution and differentiation of eczematous and trachomatous corneal pannus.** Ann. di Ottal., 1932, v. 60, Feb., p. 81.

Under the slitlamp more than a hundred cases of pannus were studied. They were divided into two groups: (a) the pannus which invades the cornea from the beginning, starting with fine vessels which form large loops whose terminations anastomose with the neighboring vessels. This is always a superficial pannus at the beginning of its development, accompanied by corneal infiltration corresponding to the area of vascularization. It belongs to the trachomatous cornea. (b) The pannus which gradually infiltrates the cornea, the proliferative process advancing toward the central zone along a narrow region only one to two millimeters across. In this form the vessels

develop in the superficial and deep corneal parenchyma; they are short and sinuous, resembling a spirochete. This form is not at first accompanied by corneal infiltration, although such infiltration develops later. It was found in eczematous pannus. *Park Lewis.*

Heintz, G. **Ulcus rodens.** Zeit. f. Augenh., 1932, v. 77, June, p. 289.

Five cases are reported, three of which were studied histologically. In one in which the usual histological characteristics were evident, there were also some atypical findings which might shed light on the etiology. The inflammatory infiltration of the central border of the ulcer not only undermined the most superficial layers, but invaded the deepest layers to a considerable distance beyond the loss of superficial substance. The vascularization was not limited to the zone of infiltration but invaded the superficially normal cornea. In another eye the ulcer invaded the sclera. The destruction of scleral tissue was limited to the superficial layers. A fairly extensive review of the literature discloses the fact that ulcus rodens is regarded either as a trophoneurosis or as an infectious corneal lesion. The author's observations persuade him that a trophoneurotic pathogenesis is unlikely.

F. Herbert Haessler.

Hofe, K. vom. **The reaction of the cornea to a single injection of foreign serum in rabbits infected with lues at different stages.** Klin. M. f. Augenh., 1932, v. 89, July, p. 28. (Ill.)

The experiments showed that luetic rabbits reacted more frequently and intensely than normal animals to one injection of inactive horse serum.

C. Zimmermann.

Kanerva, Aimo. **A case of aspergillus keratitis.** Acta Ophth., 1932, v. 10, p. 377.

A four-year-old child developed an ulcer of the cornea, which in the laboratory was proved to be due to aspergillus fumigatus. Clinically this type of infection is characterized by a central ulcer, surrounded by a ring of infiltration, with an intervening clear zone. In this case it healed under xeroform powder and atropin-iodoform salve.

Ray K. Daily.

Lauterstein, M. **Arcus lipoidis corneæ.** Zeit. f. Augenh., 1932, v. 78, July, p. 55.

The author observed a woman in whom crescentic deposits in the cornea probably consisted of fat and cholesterol crystals. The blood cholesterol was increased. After treatment, which consisted of injections of insulin and a diet poor in fat and cholesterol, part of the opacity became absorbed, leaving a pannus-like network of bloodvessels. Because of poor cooperation on the part of the patient the observations were fragmentary. *F. Herbert Haessler.*

Srinivasan, E. V. **A case of cured Mooren's ulcer.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 64.

The patient had been treated for over one month by another physician. Three-fourths of the corneal circumference was involved. He was put on tuberculin, with magnesium sulphate irrigations, and the eye was bandaged. The ulcer advanced and a conjunctival flap was placed over the ulcer. The ulcer healed where the conjunctiva became adherent. Repetition of the conjunctival flap resulted in complete cure.

M. E. Marcove.

Srinivasan, E. V. **A family of Groenouw's dystrophy.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 68.

Seven female members of one family had Groenouw's dystrophy. The younger members showed the commencing dystrophy as a superficial punctate keratitis, the spots being mostly on the corneal nerves. These children had no symptoms. The next older set had typical Groenouw's nodular opacity. Brownish spots of rounded or irregular shape occupied the central two-thirds of the cornea, with the circumference practically free. The large spots were surrounded by the smaller. The cornea between the spots was practically clear. In the oldest members of the family the nodular dystrophy was

lattice-shaped under the slitlamp, the opacities appearing as regular ribbon-shaped bands traversing irregularly the middle three-fourths of the cornea. The cornea between the opacities was cloudy. There were irregular fixed white lumps on the posterior surface of the cornea. These were not found in the other two varieties. Only one of the members complained of defective vision. *M. E. Marcove.*

Wright, R. E. **The contact glass as an aid in corneal plastic surgery.** Brit. Jour. Ophth., 1932, v. 16, Aug., p. 473.

This surgeon discusses the advantage and disadvantage of various conjunctival flap operations in corneal wounds of different types. He devised two operations. One was the making of a long narrow ribbon of conjunctiva, drawing it across the cornea to cover the wound, and anchoring it on the opposite side. The other method was to take a thin epithelial ribbon from the inner side of the arm and anchor each end in the limbal conjunctiva, the body covering the floor of the corneal wound. In each instance the whole strip was covered with a contact glass. Both operations proved successful.

D. F. Harbridge.

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Adie, W. J. **Complete and incomplete forms of the benign disorder characterized by tonic pupils and absent tendon reflexes.** Brit. Jour. Ophth., 1932, v. 16, Aug., p. 450.

The complete form is characterized by the presence of tonic convergence reaction in a pupil apparently inactive to light, and by absence or diminution of one or more of the tendon reflexes of the lower limbs. The incomplete form presents: (1) tonic pupils alone; (2) atypical phases of the tonic pupil alone; (3) atypical phases of the tonic pupil with absent tendon reflexes; (4) absent tendon reflexes alone. Most of the cases of ophthalmoplegia interna, internal unilateral ophthalmoplegia, iridoplegia, and partial iridoplegia for which no cause can be found are probably examples of an incomplete form of this disorder. It has no relation to syphilis. It runs a benign course without the addition of further symptoms, and is compatible with long life.

D. F. Harbridge.

Foster, J. **Optical iridectomy, indications, method, and value.** Brit. Jour. Ophth., 1932, v. 16, Aug., p. 476.

The cases are divided into two classes: (1) optical obstruction due to opacities in the cornea or lens; (2) pupillary deformation, including (a) occlusion and seclusion, (b) drawing up of the pupil after lens extraction. The three types of operation are narrow pupillary-border iridectomy, simple button-hole, and the full width of the iris. Cases resolve themselves into operations of "election", when vision in the other eye is good, and of "necessity", when vision is poor in both eyes. The author's statistics show that of ten electives only one was slightly benefited. In the necessitous class nine out of thirty showed some improvement. A detailed record of thirty-five cases is appended. *D. F. Harbridge.*

Fradkine, J. **Papilloretinitis and gross hemorrhage into the vitreous of sympathetic origin, occurring ten years after injury.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 561.

Fradkine reports the case of a patient the vision of whose right eye was lost in 1920 after a perforating injury. Phthisis bulbi resulted, but the eye was not enucleated. In 1930 the left eye developed a large hemorrhage into the vitreous, followed by an inflammation of the papilla. There were no signs of anterior uveal disease. After enucleation of the atrophied right eye and intensive autohemotherapy, healing occured with good visual result. The author considers the case one of sympathetic ophthalmia of posterior localization. *Phillips Thygeson.*

Nakamura, B. **Successful treatment of exudative uveitis and sympathetic ophthalmia with "A O" (a tuberculosis vaccine).** Klin. M. f. Augenh., 1932, v. 89, July, p. 43. (Ill.)

One case of tuberculous exudative choroiditis and iritis, and two cases of sympathetic ophthalmia with detachment of the retina after perforating injuries, with typical tuberculous changes, are reported in detail. All were successfully treated with "A O", which the author considers superior to Koch's tuberculin. To the end of 1931 five hundred cases were treated with "A O". These included cases tuberculous or suspected of tuberculosis, or otherwise etiologically uncertain or refractory to antiluetic treatment, as parenchymatous keratitis, phlyctens, scleritis, episcleritis, sclerosing keratitis, periphlebitis of the retina, opacities and hemorrhages of the vitreous, neuroretinitis, choroiditis, and scrofulous inflammations. The advantage of "A O" lies in its healing action without secondary effects. *C. Zimmermann.*

Ollendorff, Ulrich. **The etiological value of the settling reaction of the blood corpuscles for iritis and iridocyclitis.** Klin. M. f. Augenh., 1932, v. 89, July, p. 33.

Sixty-five cases of iritis and iridocyclitis were examined. The settling time was accelerated in all six cases of tuberculosis with positive pulmonary changes; was accelerated in fifteen cases of tuberculosis without positive pulmonary changes, in fourteen not; was accelerated in six cases of rheumatism, in eleven not; accelerated in one case of arteriosclerosis, in three not; was accelerated in one case of unknown cause, in eight not. It is very probable that the settling time depends on inflammatory processes of the whole body, not solely of the eyes. From these investigations no differential diagnostic importance for the etiology of an inflammatory eye infection can be attributed to the settling reaction of the blood corpuscles. *C. Zimmermann.*

Salus, Robert. **Harada's disease.** Klin. M. f. Augenh., 1932, v. 89, July, p. 84.

This is an acute diffuse exudative uveitis, first described in 1926 by Harada of Japan. It occurs bilaterally in from the third to fifth decades of life, beginning with headache, occasionally vomiting and general malaise, usually slight or even no involvement of the anterior segment, opacities of the vitreous, disc changes like papillitis, and extensive diffuse yellowish opacity of the retina. After a few weeks detachment of the retina sets in, but it gets flatter and completely subsides with surprisingly good vision, but leaving depigmentation of the whole fundus with the exception of a few pigmented foci. Only about twelve or fifteen cases, all in Japan, have been recorded. Tagami considers the disease due to a specific virus or agent. Salus reports a case, apparently the first outside of Japan, in a woman aged thirty-eight years. A sister of the patient, aged thirty-five years, developed bilateral iridocyclitis two months later. *C. Zimmermann.*

8. GLAUCOMA AND OCULAR TENSION

Almeida, Antonio. **Minor considerations in the surgery of glaucoma.** Rev. de Ophth. de São Paulo, 1932, v. 2, June, pp. 8-14.

The author illustrates his rather discursive paper with a number of case reports. *W. H. Crisp.*

Amsler, Marc. **Spontaneous fluctuations of normal ocular tonus.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 537.

In a tonometric study of normal eyes Amsler notes fluctuations varying from 3 to 16 mm. of mercury in about two-thirds of the cases. He concludes (1) that a single reading, no matter how accurate, does not suffice to give a true indication of normal ocular tension; (2) that there is no typical normal tonometric curve; (3) that the normal intraocular tension is stable or unstable according to the case; (4) that future research should be directed toward determining the local and general conditions causing stable and unstable normal intraocular tension.

Phillips Thygeson.

Bailliart, P. **Some considerations regarding tonometry.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 547.

When a sensitive tonometer is placed on the cornea it is rare that the needle

comes to a standstill immediately. Two types of movement frequently appear: the first is oscillatory and marks the dilatation of the intraocular arterioles; the second is a slow and regular movement either up or down the scale. Bailliart discusses this latter type of movement. It is progressive lowering of the tension which results most frequently. The author considers this a normal reaction and by consequence a favorable clinical sign. It is due to modification of the choroidal venous network, a flattening of the vessels, and indicates prompt adaptation of the intraocular tension to new conditions. In a certain number of cases there will be no change in the intraocular tension during a test period of fifteen seconds. This is explained by the assumption that the choroidal vessels have lost their normal elasticity, or that the venous pressure is abnormally elevated, or that there is some obstruction to venous return. The prognosis is therefore less favorable.

Phillips Thygeson.

Bistis, J. **Concerning the action of insulin on intraocular tension.** Arch. d'Opht., 1932, v. 49, June, p. 375.

In two diabetics the tension was taken by the author before and after the injection of insulin. In the first, with a blood sugar of 0.17 the tension increased from 20 to 25 mm. following twenty-four units of insulin. The blood sugar was reduced to 0.12. The second patient's blood sugar was 0.333. Eighteen units of insulin produced no change in intraocular tension, although the blood sugar was reduced to 0.25. The opinion was expressed that in the second case no increase in tension occurred because the blood sugar was not brought down to a low enough level to allow osmotic and colloidal changes in the eye. Warning is given to be certain that the intraocular tension of diabetics is normal before using insulin.

M. F. Weymann.

Charlin, Carlos. **Inflammatory glaucoma without increased tension.** Klin. M. f. Augenh., 1932, v. 89, July, p. 88.

Two cases are reported showing that bulbar injection and mydriasis may occur without increased tension in the initial stage of acute glaucoma at the time of examination. In the second case the night test and the visual field confirmed the diagnosis. One must think of this type to avoid the serious error of making the diagnosis of cyclitis (which from the condition of the aqueous and deposits on Descemet's membrane may be conceivable), and employing deleterious treatment. *C. Zimmermann.*

Colomba, N. **Means of early diagnosis of chronic simple glaucoma.** Ann. di Ottal., 1932, v. 60, March, p. 218.

In simple chronic glaucoma, the highest tension is between three and seven in the morning, the muscular movements in the day giving the effect of massage which ceases during the night. The tension should always be taken in both eyes. If a difference of more than 2 or 3 mm. Hg is present it should be regarded with suspicion. If under pilocarpin or eserin the tension is reduced from 24-26 to 18-19, glaucoma should be suspected. Limitation of the fields especially for color is an ever important indication. A provocative dose of coffee or of caffeine will increase the tension in predisposed eyes. This may also be induced by placing the subject for forty or fifty minutes with the head in a dependent position. Stasis should not be permitted in those with arteriosclerosis, because of danger of hemorrhage. Total obscurity is not good for eyes with latent glaucoma. If after suitable preparation a liter of water is taken in the course of two or three minutes, the tension will be raised in eyes predisposed to glaucoma.

Park Lewis.

Lacat, C. **Considerations on the medical treatment of glaucoma.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 554.

Lacat reports favorable results in treating primary glaucoma according to Abadie's method (general medical: adrenalin, ergotin, calcium chloride). In secondary glaucoma it is necessary to find the primary cause. He cites a case of secondary glaucoma, considered of luetic origin, which failed to respond

to ordinary local and general treatment but reacted promptly to intravenous mercury injections.

Phillips Thygeson.

Marin, A., and Marin, E. **Iridocyclitis with sympathetic irritation cured by autohemotherapy.** Arch de Oft. Hisp.-Amer., 1932, v. 32, July, p. 373.

A child of ten years, while chipping a millstone, felt something strike his right eye. He was treated by a general practitioner and two weeks later by an ophthalmologist who dismissed him with an atropin salve. He saw well for eight months, but presented fourteen months after the accident a corneal point of entry and a cataractous lens. An intraocular magnetic foreign body was diagnosed and magnet extraction brought out from the lens at the 12:30 o'clock position a particle of iron which fell to the bottom of the anterior chamber. Its extraction necessitated an upward iridectomy, which was followed by extraction of the cataract. Ten days later iridocyclitis with sympathetic irritation of the fellow eye set in, which resisted all treatment for two weeks but responded promptly to autohemotherapy. This was continued for three months (with suspension of atropin because of conjunctivitis) with perfect results. The outcome confirms the writer's belief in the anaphylactic nature of sympathetic ophthalmia, and in the logic of its treatment by autohemotherapy. Attention is called to tolerance of intralenticular foreign bodies by the eye. There was no siderosis.

M. Davidson.

Rollet, J. **Vascular state of the glaucomatous.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 551.

Rollet studied twenty-five cases of primary glaucoma with reference to general vascular condition. He found 9, or 36 percent, to have a typical hypertension, 7, or 28 percent, to have a mild hypertension, and 9, or 36 percent, to have normal systolic pressure. In considering the diastolic pressure alone he found 19 subjects, or 76 percent, with hypertension. Other methods of examination, including x-ray and the hot water test, also indicated circulatory disturbances in the majority of the cases. The author supports the theory that glaucoma is essentially a vascular disease. *Phillips Thygeson.*

Szimanski, J. **Surgical treatment of glaucoma.** Rev. de Ophth. de São Paulo, 1932, v. 1, March, pp. 211-216.

The author calls his operation the "half-Elliot". He uses a 3-mm. trephine with a center pin, applies the trephine at one edge only, in such fashion that the center pin lies parallel to the iris; and cuts with the trephine only a half circle of sclera. He then excises this half circle of sclera with scissors, the piece of sclera excised thus having dimensions of 1.5 by 3 mm. He regards this operation as easier and safer than the regular Elliot trephining. The protruding iris is often cut off with the semicircle of sclera. *W. H. Crisp.*

Villaret, M., Justin-Besançon, L., and Gallois, J. **The action of alpha methylacetylcholin on the iris and on ocular tension.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 532.

The authors confirm the findings of Reid Hunt (1914) relative to the miotic action of instillations of this drug. Mixtures with bromocholin, histamin, yohimbin, ergotamin, and pilocarpin do not appreciably influence its action. Instillation of the drug is without action on the mydriasis produced by atropin but readily contracts the pupil dilated by ephedrin. Subconjunctival injection produces a more rapid miosis but the duration is considerably shortened. Subcutaneous injection also produces miosis, equal in the two eyes. Intraocular tension is lowered in the cat and dog by instillations, and by subconjunctival and subcutaneous injections of the drug. *Phillips Thygeson.*

Wood, D. J. **A suggestion as to the cause of glaucoma following thrombosis of the retinal vein.** Brit. Jour. Ophth., 1932, v. 16, July, p. 423.

In eight cases of thrombosis the author observed that where the hemorrhage was extensive the vitreous was opaque to red-free light. This occurred

in three cases which developed glaucoma. It is suggested that some substance, formed from hemoglobin, is absorbed into the vitreous and alters its light transmitting properties.

D. F. Harbridge.

9. CRYSTALLINE LENS

Bujadoux, A. **Results of forty-four cases of cataract operated on by Junès' method.** Ann. d'Ocul., 1932, v. 169, July, pp. 545-557.

The special feature of this simple extraction (without iridectomy) is the corneal section in the temporal limbus. The incision is performed with scissors after puncture, cutting vertically downward in the left eye from the 2 o'clock position, and upward from the 8 o'clock position in the right eye. Security and safety are claimed for the procedure. The visual and anatomical results resemble those from other methods.

H. Rommel Hildreth.

Fisher, W. A. **A new suction method for the intracapsular cataract operation.** Amer. Jour. Ophth., 1932, v. 15, Sept., pp. 844-848.

Giannantoni, C. **The index of refraction of the aqueous humor in cataractous subjects.** Ann. di Ottal., 1932, v. 60, March, p. 161.

Comparison is made as to the index of refraction of the aqueous humor and of blood serum in cataractous and in noncataractous subjects. The following conclusions are drawn: The index of refraction of the blood serum in subjects affected by cataract is higher in older individuals and in those without opacity of the lens. Correspondingly the aqueous humor shows, in those in whom the lens is not opaque, a concentration greater than normal. The index of refraction of the aqueous is higher in the mature form of cortical cataract; less in the mature nuclear variety and yet less in incipient cortical; lower still in incipient nuclear cataract and in aphakia. The highest index of refraction was found in mature cortical cataract in the form of lenticular opacities. Probably this can be attributed to the fact that as the cataract matures it becomes reduced in volume and reverses the aqueous flow, thereby causing disintegration. The author's researches disprove the hypothesis that nuclear cataract is due to dehydration of the lens as a result of increased saline content of the aqueous humor. (Bibliography.)

Park Lewis.

Goldfeder, A. E. **Cataract extraction in keratoconus.** Zeit. f. Augenh., 1932, v. 77, June, p. 350.

A two-stage extraction without complication was performed in a forty-year-old patient with keratoconus. With complete freedom from irritation, severe pains occurred three to four months later, followed by progressive phthisis, without further pain or redness. The author emphasizes that his case and Michelsen's should warn us to be cautious, particularly in the presence of signs of healed or active choroiditis.

F. Herbert Haessler.

Holm, Eiler. **Some cases of false lenticonus in children.** Acta Ophth., 1932, v. 10, p. 327.

This is a report of three cases of "double focus lens" in children, due to a central well defined nucleus of greater refractive power within the lens, making the center of the lens myopic and the periphery hyperopic. The slit-lamp examination demonstrated this condition, which might be mistaken ophthalmoscopically and retinoscopically for posterior lenticonus.

Ray K. Daily.

Jacqueau, A. **The method of Junès (vertical incision) in the operation of cataract extraction.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 395.

Jacqueau has operated on fourteen cases by the method of Junès and is well pleased with the results. The incision is made with a keratome at the temporal limbus and is completed with curved iris scissors. Rupture of the capsule and expulsion of the lens are performed in the ordinary manner. Iridectomy does not appear to be required if the pupil is well dilated with atropin before the operation. In the author's series no prolapses occurred. The prin-

cipal advantages of the vertical incision are exposure of the operative field without the necessity of turning the eye down, second, rapid closure of the wound and consequent suppression of iris prolapse, and vertical astigmatism in place of the usual horizontal type. The inconveniences of the method are minor. *Phillips Thygeson.*

Jensen, V. A. **Hemorrhage into the anterior chamber in cataract operations with and without the use of adrenalin.** Acta Ophth., 1932, v. 10, p. 382.

Of eighty consecutive cases of cataract extraction adrenalin was used in every other case. A comparison of the forty cases in which adrenalin was used with the forty without adrenalin shows that the percentage of hemorrhages into the anterior chamber is about the same, but the distribution different. In the cases without adrenalin the majority of hemorrhages occurred at operation, while with the use of adrenalin they occurred within the first forty-eight hours after operation. *Ray K. Daily.*

Lavagna, F. **The problem of immunity in the course of experimental cataract.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 407.

Lavagna produced cataracts in guinea pigs by inoculation of human cataractous material ground in salt solution. Intraocular inoculation produced experimental cataract in eighty percent of the animals, subconjunctival inoculation in sixty-five percent, and subcutaneous inoculation in forty-three percent. One of these animals three months after inoculation had offspring with bilateral cataract. A second series of animals was inoculated in a similar manner with pooled cultures of certain bacteria isolated previously from human cataracts. The results of these inoculations were parallel to those obtained with the cataractous lens material. A third series of animals was first vaccinated by peritoneal and subconjunctival injection of killed cultures and then inoculated with the living bacteria as in the second series. There was a distinct diminution in the percentages of cataract obtained. The author concludes that human cataract is transmissible to the guinea-pig either by direct inoculation of tissue or by bacteria obtained from the cataract, and that the receptivity of the animal to experimental cataract can be diminished by vaccination. *Phillips Thygeson.*

Law, F. W. **Uniocular zonular cataract.** Brit. Jour. Ophth., 1932, v. 16. July, p. 386.

The author reviews the literature, reports six cases of his own, and discusses the growth and nutrition of the lens, and the relation of the condition to trauma. He concludes: (1) The cause of monocular cataract is trauma, almost invariably of the nonpenetrating variety. (2) The injury is of such kind as to cause a tendency toward dislocation of the lens; in quite half the cases, dislocation actually occurs. (3) The cause of the zonules or lamellæ of opacity is a temporary disturbance of the nutrition of the lens, brought about most probably by severance of physiological connection between lens and capsule, with consequent alteration in the capsular permeability. (4) The recorded cases support the view that such a type of opacity is more likely to occur in a young, actively growing lens than in an adult lens. (5) While it may be suggested that inflammation is an alternative cause of zonular opacity, the immediate cause presumably being chemical or toxic action by the nutrient fluids, such a suggestion finds no support in this investigation. *D. F. Harbridge.*

Narayana Rao, B. K. **Infantile cataracts and a modified procedure in their operative treatment.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 21.

The author cites 101 cases between the ages of three months and twelve years during the period 1923 to 1930. Of these forty-nine were unilateral and fifty-two bilateral. Many had a history of infantile convulsions, chronic diarrhea, fever, dysentery, or general ill health. The author prefers modified linear extraction without iridectomy. *M. E. Marcove.*

Srinivasan, E. V. **Rare complications during and after cataract operations.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 27.

The first complication is complete iridectomy during an attempt at ordinary iridectomy. There was no bleeding and convalescence was uneventful. There was no photophobia, and vision was 6/12 with correction. In the second case the patient, after the counterpuncture, suddenly turned the eye upward. The cataract knife was turned about and a section made towards the limbus below. There were no complications and the visual acuity was good. In the third case a peculiar white powdery mass was seen on the fourth day after operation, just behind the level of the iris, freely movable, and attached only by a pedicle. The mass did not disappear. *M. E. Marcove.*

Tiere, A. **An improved procedure in the operation for senile cataract.** Ann. di Ottal., 1932, v. 60, March, p. 213.

In the operation for expression of senile cataract there are advantages in the incision made by the lance-shaped knife. It is inadequate, however, for a sufficiently large section. The method proposed by the author is as follows: After the usual preliminaries, the conjunctiva is undermined on either side, forming sacs reaching to the horizontal diameter of the cornea. When these are completely dry an incision is made from above at the limbus with a triangular knife. This is enlarged with blunt-pointed curved scissors and the cataract removed in the usual way under the elastic conjunctival tissue. It is believed that this method more safely permits the passage of a large nucleus, with less danger of entangling the iris in the wound. It favors the coaptation of the edges of the wound and is an added safeguard against infection. (Plates.) *Park Lewis.*

10. RETINA AND VITREOUS

Arruga, H. **Contribution to the study of retinal detachment and its treatment.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 461.

Arruga presents a series of drawings showing the evolution of retinal tears. He also describes a new instrument to facilitate localization and cauterization of tears. It consists of a small lancet-shaped blade, 3.5 mm. in length, which is fitted with a thin shell-like stop adapted to the curve of the eyeball. Projecting through the shell is a small handle. The instrument pierces the sclerotic at the point corresponding to the tear and is then left in place. With the ophthalmoscope the position of the blade can be clearly seen, and if correct the instrument can be withdrawn and the cauterization performed at the site of the puncture. If the blade does not strike the tear the relative position can be readily calculated and the cauterization performed at the proper point; in which case the puncture produced by the instrument must also be cauterized. Arruga believes that the initial lesion in detachment is retinal or chorioretinal, consisting of a degenerative or destructive post-inflammatory condition which produces a solution of continuity of the retina and thus places the vitreous in contact with the choroid. *Phillips Thygeson.*

Böck, J. **Periarteritis nodosa in the eye.** Zeit. f. Augenh., 1932, v. 78, July, p. 28.

In one patient with periarteritis nodosa, in whose eyegrounds no clinically visible changes were found, histological studies revealed in each eye a discrete thickening of the arterial walls with structure typical of arteritis nodosa. In a second patient, a seventeen-year-old male with septic and abdominal symptoms as well as evidence of kidney disturbance, retinal detachment occurred in both eyes. The retina became reattached, but there occurred transient chemosis of both conjunctivas, an episcleral inflammation which healed, and finally bilateral optic neuritis. All these things could occur in nephritis, but whereas the nephric lesion was not severe and the skin nodules which had been excised were histologically characteristic of periarteritis nodosa, the ocular changes were ascribed to the latter disease. *F. Herbert Haessler.*

Brill, E. H., and Weil, R. **Angioid streaks and pseudoxanthoma elasticum of the skin.** Zeit. f. Augenh., 1932, v. 77, June, p. 319.

In all five cases of angioid streaks of the fundus in various stages of development, pseudoxanthoma of the skin was also present. In four patients the diagnosis was clinically obvious, and in the fifth it was demonstrated by histological study. Since both the eye and the skin lesion are rare it seems impossible to doubt that both are manifestations of the same disease. Histological studies of the skin revealed an atrophy of the elastica of the blood vessels as well as of the cutis. This explains the spontaneous hemorrhages. Though histological studies of the eye are lacking, the streaks in the fundus probably result from ruptures in the lamina vitrea which is atrophic as a result of the general degenerative process.

F. Herbert Haessler.

Dejean, C. **Concerning the possible rôle of polypeptidemia in the genesis of azotemic retinitis.** Arch. d'Opht., 1932, v. 49, July, p. 447.

The occurrence of albuminuric retinitis has apparently no definite relation to the amount of urea, creatinin, or cholesterol in the blood, or the amount of albumen in the urine. Two cases are cited in which the appearance of albuminuric retinitis coincided with an increase in the polypeptid content of the blood. The polypeptidemia does not depend upon the condition of renal filtration, but upon a disturbance of protein metabolism, with, in certain cases, hepatic insufficiency. In chronic nephritis without complications the polypeptid index parallels that of urea in the blood, but with complications, particularly retinitis, the polypeptid index increases above that of urea. Polypeptids are quite toxic and particularly attack the central nervous system. As the retina is embryologically a portion of the diencephalon, it is not without reason to assume that it also may be particularly adversely affected by this agent. The two case reports mentioned above are presented in support of such a theory. *M. F. Weymann.*

Dubar, J., and Lamache, A. **Functional examination of the central artery of the retina.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 509.

Dubar and Lamache insist on the clinical importance of the determination of retinal arterial tension and of measurement of the resistance of the wall of the central artery. They believe that the functional and anatomic state of the intracranial vessels can be inferred from the condition of the central artery, since all belong to the carotid system. They also believe that the local vasomotor state often plays a considerable rôle in the production of troubles of the elastic arterial wall.

Phillips Thygeson.

Fritz, A. **The effects of arterial rigidity on the retinal circulation.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 511.

Fritz has made simultaneous observations, in a large number of cases, of the minimal pressure of the central artery of the retina, of its state of rigidity, and of its caliber. He has reached the following among other conclusions: (1) In cases of slight arterial rigidity, visual disturbances appear only with a marked hypotension and these vary momentarily with changes in the pressure. (2) Marked arterial rigidity, with normal pressure, may produce deficient retinal circulation with visual difficulties and even optic atrophy. With marked hypertension, rigidity allows more or less normal circulatory conditions and even lessens the danger of rupture and hemorrhage. (3) The formation of connective tissue is stimulated by hypertension, but this defense mechanism is in itself a source of danger, since often the sclerosis occurs to such an extent that the lumen becomes obliterated. (4) Diminution in caliber of an artery of feeble rigidity, unless in persistent spasm, offers in itself no alarming prognosis. But diminution in caliber of an artery of great rigidity is the expression of an obliterating endarteritic process.

Phillips Thygeson.

Hambresin. **A case of recurrent hemorrhage into the vitreous in a young**

adult. Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 439.

Hambresin discusses the bases advanced by different authors to explain the etiology of recurrent hemorrhage into the retina and vitreous, in particular endocrine dysfunction, hemophilia, syphilis, and tuberculosis. In the case which he reports he regards tuberculosis as the etiological factor, and he believes this factor to be active in the majority of cases. For treatment he recommends antituberculosis therapy, and especially radiation of the eye and spleen with x-rays. For severe cases he suggests ligation of the carotid artery.

Phillips Thygeson.

Leplat, Georges. **Contribution to the study of the vitreous body.** Ann. d'Ocul., 1932, v. 169, July, pp. 531-545. (See Amer. Jour. Ophth., 1932, v. 15, Sept., p. 877.)

Milner, J. G. **Retinitis pigmentosa and retinitis punctata albescens.** Brit. Jour. Ophth., 1932, v. 16, July, p. 418.

Retinitis punctata albescens occurred in a young woman whose mother was blind from retinitis pigmentosa. In the daughter the condition was apparently stationary. In the second family the oldest child was quite normal, but his brother and sister were deaf-mutes with retinal degeneration. The girl was an example of typical retinitis pigmentosa. The boy presented small yellowish-white spots scattered all over the fundi. The fields were restricted to ten degrees. *D. F. Harbridge.*

Perez Llorca, J. **A case of external exudative retinitis (Coats).** Arch. de Oft. Hisp. Amer., 1932, v. 32, July, p. 349.

Since the disease is rare, has a fundus picture not sufficiently characteristic, and occurs in the young, it may be easily mistaken for glioma, particularly since in true glioma transillumination may also be positive. Such a case, reported and illustrated with microscopic sections, occurred in a child of ten years who presented pain, hypertension, negative transillumination, and a yellowish, immobile detachment, on the basis of which glioma was diagnosed and the eye enucleated. Sections showed a thickened retina, a caseous cellular subretinal exudate, desquamation of pigment epithelium cells which were found scattered and more abundant near the retina and adherent to it, no rosettes nor other evidence of tumor, a few hemorrhages on the internal retinal surface but no aneurismal dilatations or suggestion of angiomatosis. In the opinion of the author this case does not confirm the identity of Coats' and Hippel's disease.

M. Davidson.

Redslob, E. **Contribution to the study of the pathogenesis of retinitis proliferans.** Ann. d'Ocul., 1932, v. 169, July, pp. 513-530.

The organization of a vitreous hemorrhage is the theory of widest acceptance. Another theory supposes proliferation taking origin from the adventitia of diseased blood vessels. A case is reported with anatomical study of the eye, after injury fourteen years previously. The retinal vessels were sclerosed, while the fundus vessels of the good eye were normal and there was no systemic or general vascular disease. A mass of fibrous tissue appeared to have first arisen by neurogliosis, with secondary infiltration by fibrous tissue. *H. Rommel Hildreth.*

Reis, Wiktor. **Retinal venous pulsation and intracranial pressure.** Zeit. f. Augenh., 1932, v. 78, July, p. 47.

This is a clinical control of Baurmann's method of using the pressure necessary to induce retinal venous pulsation as an indicator of the pressure within the cranial cavity. The author finds the method clinically reliable. It is the method of choice for measuring intracranial pressure. Spinal puncture need be done only when an examination of the spinal fluid is indicated.

F. Herbert Haessler.

Terrien, F., Veil, P., and Dollfus, M.-A. **Seven observations of retinal detachment treated by the Guist method.** Arch. d'Opht., 1932, v. 49, June, p. 353.

The technique of the Lindner-Guist operation as practiced by the authors

is localization of the area of greatest detachment or of the tear with the ophthalmoscope, and marking of the meridian as for the Gonin procedure. After local anesthetization, resection of a conjunctival flap, and division of rectus muscles if necessary, a semicircle of trephine applications not quite perforating the sclera is made 1 to 2 mm. apart near the equator. A second and even a third row is made inside the first. As many as sixteen trephine openings were made in one eye. Completion of removal of the disc from the sclera is done with a short Graefe knife to avoid perforating the choroid. If this latter accident occurs, the operation must be delayed until healing takes place. Small bleeding points are stopped by touching with the tip of a heated lacrimal probe. After all the scleral discs are removed and the field is perfectly dry, two adjacent openings are touched with the dry tip of a potassium hydroxide pencil, immediately followed by abundant lavage with saline solution and neutralization with one percent sterile acetic acid. The field is again dried and this procedure repeated until caustic has been applied to all the openings. Then one-third to one-fourth of the openings are perforated with the tip of a lacrimal dilator to allow the subretinal fluid to escape. The muscles and conjunctiva are sutured back in place and a binocular bandage applied. Atropin is used for six to eight days. The patient is allowed up on the twelfth day. If the retina remains in place five to six weeks the patient is considered cured.

Seven case histories are given in detail. Only one had a visible tear. There were four immediate cures, one redetached after three weeks. Of the three failures, two were due to perforation of the choroid in the early stages of the operation, and the third showed excessive hypotony with vitreous disturbances. In one case of involuntary perforation completed by multiple cautery punctures a cure was not obtained. This is interpreted as a demonstration of the inefficiency of multiple cautery punctures where no tear exists.

This operation, because of its relatively high percentage of cures in this type of retinal detachment, is considered a definite advance in such treatment. Its only drawbacks are its tediousness and extremely exacting technique. Chemical burns are not to be feared if proper technique is used.

M. F. Weymann.

Velhagen, K., Jr. **The clinical importance of atypical retinitis pigmentosa.** Klin. M. f. Augenh., 1932, v. 89, July, p. 1, (Ill.)

Velhagen described three cases of atypical retinitis pigmentosa with idiocy and fatty dystrophy. Neurologic-psychiatric analysis by Ritter showed that one case belonged to the Laurence-Biedl syndrome and two to the familial amaurotic idiocy type of Spielmeyer and Vogt. The literature, like the cases, reveals that the atypical forms of retinitis pigmentosa are characteristic for both diseases, but not without exception. The relation of ordinary retinitis pigmentosa to the eye affection in these two degenerative diseases is still in doubt. The import of hypophysis and midbrain for the origin of tapetoretinal degenerations is discussed in detail. Atypical retinitis pigmentosa must be a special indication to search for retinocerebral degenerations, whose prognosis is much more serious than that of ordinary retinitis pigmentosa.

C. Zimmermann.

Villard, H. **Spontaneous cure of detachment of the retina.** Arch. d'Opht., 1932, v. 49, June, p. 368.

Inspired by a previous article of Weekers, this writer produces from his records of the past thirty-six years, during which hundreds of retinal detachments have been seen, the histories of nine patients who, anatomically and spontaneously, have completely recovered from detachment of the retina. However, only two patients recovered good vision. Five patients had moderate visual recovery and four had practically no vision, although anatomically the retina was in position. In four patients for whom proper record was kept, chorioretinal scars were seen in the reattached retina. These cases of

spontaneous reattachment of the retina should be regarded as medical curiosities and not cited to prevent the undertaking of immediate operative treatment. *M. F. Weymann.*

Worms, G., and Chams, G. **Retinal arterial tension in nasal disease.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 524.

After intranasal operations hypotension of the retinal arterial pressure may explain the healing of certain retrobulbar neuritides of either nasal or other etiology. Certain lesions of the nasal fossa are often accompanied by retinal hypertension with or without ocular symptoms (narrowing of the visual field, scotoma, arterial spasm, partial or complete atrophy of the optic nerve, retrobulbar neuritis syndrome. Atrophic rhinitis is accompanied almost constantly by retinal hypotension, which suggests a sympathetic factor in the pathogenicity of atrophic rhinitis.

Phillips Thygeson.

Worms, G., and Chams, G. **The vestibuloretinal reflex.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 525.

During the Barany test (irrigation of the ear) there occurs on the side irrigated a retinal arterial hypertension (25 seconds), rapidly followed by a hypotensive phase of longer duration (45 seconds), after which the tension returns to normal. In subjects having a recent labyrinthine hyperexcitability there occurs a retinal hypertension on the side corresponding to the labyrinthine lesion. In these cases the Barany test provokes a very mild retinal arterial hypertension, followed by hypotension more marked than in the normal individual. *Phillips Thygeson.*

11. OPTIC NERVE AND TOXIC AMBLYOPIAS

Abrami, P., Gallois, J., and Fouquet, J. **Edema of the papillæ in arterial hypertension falsely suggesting intracranial tumor.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 567.

The authors describe a series of cases presenting marked arterial hypertension, symptoms suggesting increased intracranial tension, and also the ophthalmoscopic picture of brain tumor. At autopsy they were found to be tumor-free. Frequently ventriculography is the only means of determining the presence or absence of a cerebral growth. The arterial hypertension is not of diagnostic value since it may result from a tumor or may in itself be the causal factor. The papilla may or may not present hemorrhages or exudates in either condition.

Phillips Thygeson.

Behr, Carl. **Visual field findings in optic nerve disorders.** Zeit. f. Augenh., 1932, v. 78, July, p. 1.

This essay is a condensation of Behr's contribution to a Berlin postgraduate course. He discusses the diagnostic value of unilateral defects, papillomacular lesions, central scotomata, concentric contraction in meningitis, dark adaptation, and the importance of quantitative and serial examinations of the field for color and white.

F. Herbert Haessler.

Nida. **Acute bilateral retrobulbar neuritis during the course of an intensive treatment with stovarsol.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 557.

Nida reports acute bilateral retrobulbar neuritis in a syphilitic patient while undergoing intensive treatment with stovarsol, administered subcutaneously. A total of 15 gm. was injected during a period of twenty days, and only two months had elapsed since a similar course. The vision returned to normal in each eye from a low level of 5/20. The author considers the dose in this case (1.50 grams every other day subcutaneously) too high.

Phillips Thygeson.

Sarbo, Arthur. **The etiology of retrobulbar neuritis from a neurological standpoint.** Klin. M. f. Augenh., 1932, v. 88, June, p. 762.

The author chiefly discusses the differential diagnosis between rhinogenous affections of the optic nerve and those in connection with multiple sclerosis, which are in the majority. The visual impairment in sclerosis sets in

suddenly and reaches its acme rapidly. Spontaneous improvement is the rule, and in over 600 cases the author never saw final and complete blindness. Temporal discoloration is the last symptom of the pathological process in the axial fibers of the optic nerve. It is mostly bilateral, but unilaterality may erroneously suggest rhinogenous etiology. Symptoms of the other sensory organs, paresthesia of the skin, alteration of taste, aphonia, disturbance of speech and handwriting, retention of urine, and vertigo, are so characteristic that they may render an early diagnosis possible in the presence of only slight ocular signs. The visual fields ought to be tested with very small objects. After influenza an infectious etiology seems probable. *C. Zimmermann.*

Weekers, L. **A new clinical sign for differential diagnosis and prognosis of retrobulbar neuritis.** Arch. d'Opht., 1932, v. 49, Aug., p. 449.

A large white well-illuminated surface is placed about 40 cm. before the subject. The light source should be behind and to one side of the patient. The other eye is covered by the patient's hand and the eye to be tested is obscured by the cupped palm of the examiner. The patient keeps his gaze fixed in the direction of the white screen. The examiner removes his hand, and if the sign is positive there will appear upon the screen, after a latent period of about two seconds, a positive oval-shaped scotoma. This is seen for about fifteen seconds and gradually fades away. In the illustrations of the shadow as drawn by the patient it usually has serrated edges and at times a pale center. As the disease progresses toward cure this shadow gradually becomes a smaller, but retains its form until it disappears completely.

In a series of 71 cases of retrobulbar neuritis this positive sign was found in 17 instances. A positive sign was found in 14 cases out of 18 diagnosed as tobacco-alcohol intoxication and in 3 cases out of 27 of undetermined etiology. In five cases of multiple sclerosis the positive sign was never encountered.

In practically all cases where a positive sign was found complete functional recovery occurred, so that the sign may be considered as giving a favorable prognosis. (Illustrations and table.) *M. F. Weymann.*

12. VISUAL TRACTS AND CENTERS

Ask-Upmark, E. **On cortical projection of the temporal crescent of the visual field.** Acta Ophth., 1932, v. 10, p. 271. See also Det oft. Selskab i Københavns Forhandlinger, 1931, pp. 27-28. In Hospitalstidende, 1932, May 19.

After a thorough review of the literature on the subject, the author reports the case of a woman twenty-one years of age. She had headaches, vomiting, and choked discs. The blind spots were enlarged, the visual fields were contracted concentrically, and in the inferior crescent of the visual field of the left eye was a defect which progressed to a quadrant anopia. A tuberculoma in the left cerebellar hemisphere and a circumscribed tuberculous meningo-encephalitis in the right cuneus were found at autopsy. The defect of the visual field and the post-mortem findings add proof of the theory that cortical projection of the nasal periphery of the retina is in the anterior part of the calcarine region, the upper half of this retinal area being represented by the superior lip of the calcarine fissure, and the lower by its inferior lip. (Photographs of the visual fields, gross and microscopic pathology of the brain.) *Ray K. Daily.*

Ask-Upmark, Erik. **Pseudotumor of the brain diagnosed by encephalography.** Det oft. Selskab i Københavns Forhandlinger, 1931, pp. 28-29. In Hospitalstidende, 1932, May 19.

The author reports the case of a nurse, thirty-four years of age, who complained of mental disturbances for three months. She had marked bilateral choked disc, slightly diminished hearing on the right side, and neurologic findings otherwise negative. Encephalography by cisternal puncture showed normal outlines of the ventricles with-

out any dislocation. The symptoms in this case indicated a tumor of the brain with a likelihood of localization either in the cerebellum or in a silent region of the cerebrum on the right. In the first instance there should have been an enlargement and in the second a displacement of the ventricles; but when the encephalogram showed no abnormality a diagnosis of pseudotumor seemed proper. The patient, seen last after eight months, had recovered without future interference. The symptoms had disappeared, and the choked discs had receded.

D. L. Tilderquist.

Daniels, B. **Homonymous hemianopsia in migraine.** Zeit. f. Augenh., 1932, v. 77, April, p. 67.

Homonymous scotomata in the course of migraine have been reported, but this transient phenomenon is usually of such short duration that its course has not been followed perimetrically. In a man aged thirty-four years with latent lues, the author was able to record the changes in the visual field during an attack of migraine. In the beginning there was a lower-quadrant left hemianopsia. In one-half hour a peripheral crescent had recovered in the left eye. Five hours later the right eye began to clear. The remainder of the defect cleared slowly and steadily toward the center in the course of several days, leaving a very small residual homonymous scotoma which was still present three and one-half months later. Amyl nitrite and acetylcholin did not influence the field changes. Most probably a spasm of that branch of the middle cerebral artery which supplies the upper bundle of the right occipital visual tract was the underlying cause. *F. Herbert Haessler.*

Davis, Loyal. **Chiasmal symptoms in intracranial tumors.** Sec. on Ophth., Amer. Med. Assoc., 1931, 82nd session, pp. 203-237. (See Amer. Jour. Ophth., 1932, v. 15, March, p. 270.)

Delord, Émile. **Syndrome of the internal border of the cerebral peduncle. (Lesion of the optic tract and oculomotor nerve.)** Arch. d'Opht., 1932, v. 49, July, p. 460.

A patient, forty-three years of age, suffered an almost complete attack of right homonymous hemianopsia associated with paralysis of the left oculomotor nerve. The levator of the lid was only partially paralyzed and accommodation was unaffected. Localization of the lesion producing this effect was estimated to be at the inferior internal portion of the cerebral peduncle, where both the optic tract and part of the nucleus of the third nerve might be involved. The probable etiology was syphilitic pachymeningitis. The complete case report is given with a diagram of the visual field. *M. F. Weymann.*

Marx, E., and Boeve, H. J. **Meningiomata of the sella turcica. (Diagnosis and treatment.)** Arch. d'Opht., 1932, v. 49, July, p. 417.

Because meningiomata occur on the surface of the brain, the usual triad of headache, vomiting, and choked disc, indicative of intracranial tumor, is absent. Often the only symptoms are manifested through the visual apparatus, varying in accordance with the location of the tumor.

A woman twenty-nine years of age showed complete blindness of the left eye and diminished acuity in the right eye. Progressive loss of vision occurred with evidence of primary optic atrophy. The temporal field for white was at first normal, but the color fields showed temporal shrinkage. A diagnosis of meningioma was made by elimination and confirmed at operation. The right eye recovered 5/10 vision, the left eye light perception. A temporal field defect for white after the operation was probably due to operative trauma. It is suggested that more careful field taking with smaller test objects at greater distances might have revealed a temporal defect in the white field before operation. *M. F. Weymann.*

Ratnakar, R. P. **Hysterical blindness.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 90.

Five cases made complete recoveries by bizarre methods of treatment. The

author believes that fixing a definite period for cure of the condition helps a great deal. Anything that causes pain or shock, or that is out of the ordinary, has a great effect on the patient's mind.
M. E. Marcove.

Subba Rao, P. R. **A case of infantile amaurosis.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 74.

A child of almost two years suddenly developed convulsions, but after twenty-four hours was apparently normal except for complete blindness in both eyes. Both fundi were entirely negative. Laboratory examinations were negative. For six days the child showed no improvement. On the seventh day lumbar puncture was done and turbid fluid under great pressure withdrawn. The fluid showed slight polymorphonuclear leucocytosis. Next day the child was able to recognize objects at one-half meter. Lumbar puncture was repeated several times, with improvement in vision after each puncture, and in six weeks the vision was entirely normal. The author thinks that a mild attack of meningitis was the cause, although the possibility of hemorrhage into the visual cortex during the spasm could not be entirely ruled out. *M. E. Marcove.*

Tahindjis, E. **Five cases of hypophyseal tumor.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 573.

Tahindjis reports in detail five cases of hypophyseal tumor. In four, definite alterations of the sella turcica were present, and these were operated upon through the endonasal route by Hirsch of Vienna. The immediate postoperative results in three cases were favorable in spite of the fact that the disease was in each case well advanced. But two of these cases later died in coma, and the third developed complete optic atrophy. One case treated only with radiotherapy showed definite periods of improvement which proved only temporary. *Phillips Thygeson.*

13. EYEBALL AND ORBIT

Almeida, A. de. **Induced luxation of the eyeball.** Arquivos do Instituto Penido Burnier, 1932, v. 1, March, pp. 150-152.

The three patients whose cases are described were all Brazilian negroes. The greatly protruding eyes could be luxated outside the eyelids with the fingers of the patient or the surgeon. One of the patients was diagnosed as having hysteria, and the complaint of ocular pain was relieved by artificial luxation. (Illustrated.) *W. H. Crisp.*

Gastreich, Carl. **Phleboliths in orbital varices with intermittent exophthalmos.** Klin. M. f. Augenh., 1932, v. 88, June, p. 773. (Ill.)

A woman aged thirty-five years presented left intermittent exopthalmos. It was greatest when the head was bent forward and downward for about two minutes, and then changed to slight enophthalmos. There was no pulsation or vibration, but the patient complained of a feeling of tension in the orbit, vertigo, and headache. The vision was normal. The assumption of orbital varicosities was corroborated by round shadows in the roentgen picture, which were interpreted with great certainty as phleboliths. These are globular mural thrombi of fibrin, which become organized and calcified from within. After complete calcification they are detached from the intima and lie free in the lumen of the vein.
C. Zimmermann.

Marine, D., Spence, A. W., and Cipra, Anna. **Production of goiter and exophthalmos in rabbits by administration of cyanide.** Proc. of Soc. for Exper. Biol. and Med., 1932, v. 29, April, p. 822.

By injecting small doses of methyl cyanide into young rabbits the authors were able to produce moderate degrees of exophthalmos and thyroid hyperplasia. The exophthalmos occurred earliest in those rabbits which developed thyroid hyperplasia earliest and appeared proportional to the degree of thyroid hyperplasia. Those rabbits that did not develop thyroid hyperplasia did not develop exophthalmos.
Ralph W. Danielson.

Musial, Albin. **An orbital tumor which was only recognized as gumma on histological examination.** Zeit. f. Augenh., 1932, v. 78, July, p. 41.

Despite adequate antisyphilitic treatment an orbital lesion which had been diagnosed as a chronic inflammation failed to recede. Histological study after excision made the syphilitic etiology clear. The author also saw a patient with an iris gumma during the secondary luetic stage, which went on to complete destruction of vision and enucleation of the eyeball despite antiluetic treatment. There was widespread infiltration with small round cells and plasma cells, which even involved the lens.

F. Herbert Haessler.

Narayana Rao, B. K., and Ramaswamy, H. V. **Albinotic eyes: a study of four cases.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 93.

Three cases were in one family. There was no history of intermarriage. The irides were grayish-white, with a light ring near the pupillary margin. The pupils were eccentric. There was a fine horizontal nystagmus.

The author studied the rapidity of action of mydriatics and miotics on these albinotic patients and also on two light-skinned and two dark-skinned normal individuals. After full dilatation, the effect of instilling 0.5 percent eserin solution was tried. A single instillation of one percent solution of homatropin or atropin produced full mydriasis in these albinos in periods varying from fifteen to twenty-five minutes. In the fair-skinned persons, with slightly brown iris, homatropin took from sixty to seventy-five minutes for full dilatation, and atropin a little less. In the very dark-skinned persons, with very dark brown iris, only two-thirds dilatation of the pupil was obtained even after one and one-half hours with atropin and less dilatation with homatropin in the same time. In the albinos, the fully dilated homatropin pupil was contracted to normal by a single instillation of eserin, 0.5 percent, in about fifteen minutes, and to almost pin-point size in twenty minutes; while the atropinized pupils contracted to normal with one instillation of eserin, in periods varying from forty minutes to one and one-half hours. *M. E. Marcove.*

Redslob, E. **True anophthalmia and apparent anophthalmia in a new-born infant.** Ann. d'Ocul., 1932, v. 169, June, pp. 433-458.

The head of a new-born infant has been studied in detail. Born of normal parents, the infant died of intracranial hemorrhage. In the right orbit was found a rudimentary eye about 1 mm. in diameter. The optic foramen contained only the ophthalmic artery on each side. The left orbit contained no ocular tissue whatever. The chiasm ended without optic nerve development.

A lengthy discussion on pathogenesis follows. The paper is well illustrated and is accompanied by a large bibliography. *H. Rommel Hildreth.*

Shroff, C. N. **Interesting cases of unilateral exophthalmos.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 74.

The five cases of unilateral exophthalmos each presented a different etiology. An encapsulated orbital tumor was removed with good results. In the second case the diagnosis was in doubt until the eye was enucleated, when perforation of the globe was found, due to intraocular sarcoma. The third case was one of orbital abscess, the fourth was due to a tuberculoma, and the fifth case to gummatous osteomyelitis of the orbital bones. (Discussion.)

M. E. Marcove.

Suker, G. F. **Squamous cell carcinoma of the orbit. A probable metamorphosis of an adamantinoma.** Amer. Med. Assoc., Sec. on Ophth., 1931, 82nd session, pp. 17-26. (See Amer. Jour. Ophth., 1932, v. 15, March, p. 276.)

Tauferova-Karaskova, J. **Inflammatory pseudotumors of the orbit.** Oft. Sbornik, 1931, v. 6, 232-236.

During a ten-year period at the Brno clinic, fifty-two cases of tumor of the orbit were treated. On account of their course, twelve were diagnosed as Birch-Hirschfeld's inflammatory pseudotu-

mor. The treatment was conservative, namely in nine cases with roentgen rays, in two cases with tuberculin, and in one case antiluetic. In four cases complete recovery was obtained, in seven there was improvement and one case remained uninfluenced.

G. D. Theobald.

14. EYELIDS AND LACRIMAL APPARATUS

Avizonis, P. **Spontaneous prolapse of the orbital lacrimal gland.** Zeit. f. Augenh., 1932, v. 77, May, p. 167.

In 1895 Golowin pointed out that sinking of the orbital lacrimal gland was a clinical entity. Since then much discussion has accumulated in the literature. A review of this makes it clear that there is much confusion as to the essential nature and mutual relationship of prolapse of the lacrimal gland, orbital contents, blepharochalasis, and ptosis adiposa. Prolapse of the lacrimal gland produces a protuberance between the eyebrow and the upper margin of the tarsus, most evident when the patient looks down. In this mass the lacrimal gland is a palpable movable structure which occasionally slips back into the orbit. It is usually bilateral and symmetrical, is seen in young patients, and may be present at birth. The author has seen forty-three cases. It probably depends on a congenital, possibly hereditary, disproportion between the weight of the gland and the resistance of the supporting tissues.

F. Herbert Haessler.

Bailey, J. H. **A new chalazion forceps.** Amer. Jour. Ophth., 1932, v. 15, Sept., pp. 839-844.

Blair, V. P., Brown, J., and Hamm, W. G. **Correction of ptosis and of epicanthus.** Arch. of Ophth., 1932, v. 7, June, pp. 841-846.

This profusely illustrated paper deals with the consideration of these two subjects and of the technique of the authors' various surgical procedures for their correction. The former condition is corrected by strips of fascia connecting the tarsal cartilage with the occipitofrontalis muscle. As to epicanthus, a number of illustrative cases are described and illustrated. As each individual case presents an individual problem, the paper does not yield itself to abstraction. *M. H. Post.*

Danielson, R. W. **Some theoretical and practical points regarding unilateral voluntary winking.** Amer. Jour. Ophth., 1932, v. 15, July, pp. 611-617.

Favory, Albert. **A rare ocular complication of scarlatina.** Arch. d'Opht., 1932, v. 49, July, p. 463.

Two children with scarlatina had dacryoadenitis as a complication. The onset was sudden, with swelling of the preauricular gland and slight exophthalmos. In both cases the condition subsided in about one week.

M. F. Weymann.

Filatow, W. P. **Seborrhea of the meibomian glands and its consequences.** Lettura Oft., 1932, Feb., p. 80.

Corneal complications appear near the limbus either as grayish or yellowish infiltrations which ulcerate. This may appear as a complication in trachomatous pannus. In either case treatment of the meibomian disease cures the ulcers. The treatment includes digital expression daily for several weeks. In unresponsive cases curettage of the meibomian glands is done. After dividing the intermarginal space for its whole length, the tarsus is further divided with the Graefe knife up to the convex border. This exposes the glands, which are curetted. Five or six sutures are taken and the eye bandaged. This procedure obliterates all or the majority of the glands, and has proved successful in the greater number of cases.

F. M. Crage.

Gallenga, R. **Contribution to the embryological, descriptive, and topographical study of the lacrimal muscle of Duverney-Horner.** Rassegna Ital. d'Ottal., 1932, v. 1, nos. 1-2, pp. 96-147.

This masterly piece of work by Gallenga covers all that is known concerning what is usually called Horner's muscle. It is illustrated by a set of beautiful plates. The muscle was first

described by Schöbinger in 1755 and appeared in Haller's first volume of surgical disputations. In his thesis Schöbinger quotes Duverney's description. The latter did not publish an account during his lifetime but his discovery is recorded in his book which appeared posthumously. Horner described the muscle in 1823 in the Philadelphia Journal and it was soon thereafter called by his name. After an interesting historical account, Vita considers the comparative anatomy. The muscle has not been described in any lower animal. An excellent macroscopic and microscopic description of the muscle in its relations to the canaliculi, caruncle, orbicularis, internal palpebral ligament and the sac follows. The origin is independent of those of the orbicularis, although it has, in the adult, close connections with the latter. It has, probably, a common genetic origin with the internal rectus muscle.

The following divisions of the muscle are recognized: (a) a bundle directed to the lower lid which takes in most of the fibers; (b) scattered small bundles that continue with the palpebral portion of the orbicularis of the lower lid; (c) a bundle directed to the caruncle; (d) a bundle directed to the upper lid; (e) a few fibers that continue on with the palpebral portion of the orbicularis of the upper lid; (f) a few fibers that lose themselves toward the conjunctival surface without showing any connection with the canaliculi.

Eugene M. Blake.

Karbowski, M. **A new modified treatment of obliteration of the nasolacrimal canal.** Arch. d'Opht., 1932, v. 49, Aug., p. 526.

In several sittings the writer dilates the lower punctum and passes probes up to size four. Then a number three hollow Luer sound is introduced and air is blown through it to remove obstructions and fluid. A silk thread of the largest possible size, 30 to 40 cm. long, is passed through the hollow sound. This free end is blown from the nostril and the two extremities fixed on the cheek with adhesive. The thread is left in the canal from fifteen to twenty days and collargol is instilled three times daily. Before each instillation the thread is moved slightly by the patient and thereupon the contents of the sac are expressed. *M. F. Weymann.*

Klauder, J. V., and De Long, Perce. **Lupus erythematosus of the conjunctiva, eyelids, and lid margins.** Arch. of Ophth., 1932, v. 7, June, pp. 856-867.

Three cases, two in women and one in a man, are reported. In two the conjunctiva was edematous, velvety, and extremely red. In the third patient, there were, in addition to hyperemia, well defined, depressed areas, which were dry and atrophic. The lid margins, when involved, have somewhat the appearance of blepharitis marginalis, but are dry and covered with finely adherent scales, red or violaceous. Matting is absent. Atrophy sets in later. Their surfaces become irregular and the cilia are permanently destroyed. No contraction takes place, therefore no entropion or ectropion. Lesions of the skin of the lids are similar to skin lesions elsewhere. Gold and sodium thiosulphate have been effectively employed in treatment. *M. H. Post.*

Martins, Sousa. **Tears of blood.** Rev. de Ophth. de São Paulo, 1932, v. 2, June, pp. 2-4. (See Section 5, Conjunctiva.)

McCoy, L. L. **Congenital absence of puncta and canaliculi.** Amer. Jour. Ophth., 1932, v. 15, July, p. 636.

Michail, D. **Concerning cystic diverticulitis of the lacrimal sac.** Arch. d'Opht., 1932, v. 49, June, p. 384.

Three cases are reported. The first patient, a twelve-year-old boy, had had chronic dacryocystitis since birth. Operative intervention showed a thin-walled cyst lateral to the lacrimal sac and attached to it at the beginning of the nasal duct. No inflammatory reaction was present. The epithelium of the diverticulum was continuous with that of the sacs, but no communication between the cavities of the two was demonstrable. The second patient, thirty-four years of age, showed at op-

eration a blastomycetic mass obstructing the nasal duct and a diverticulum lying anterior to the lacrimal sac and communicating with it at the lacrimal duct. There was some inflammatory reaction in the walls of the diverticulum. The third patient, forty-eight years of age, had suffered a shell wound of the nose and showed a prelacrimal tumor mass. Pressure over this forced mucopurulent secretion from the lower canaliculus. At operation a cystic prelacrimal diverticulum was found communicating with the lacrimal sac, and a calcareous nodule was found in the wall of the diverticulum.

The first case was congenital, the other two were the result of injury and infection of the sac.

M. F. Weymann.

Mukerjee, S. K. **An unusual case of symmetrical ectropion of both upper eyelids, treated by blepharoplasty.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 71.

The bilateral ectropion was due to ulceration of the lids and subsequent cicatrization. Epidermal grafts were tried without success. Pedicle grafts were taken from the temporal region and the defect repaired. The results were exceptionally good.

M. E. Marcove.

Olah, E. **A new spatula for the eyelids.** Klin. M. f. Augenh., 1932, v. 88, June, p. 796. (Ill.)

The spatula is applied to the skin of the everted upper eyelid, so that only one layer of the lid lies between the spatula and the intended incision, which insures a firm surface for cutting. It is illustrated and its advantages are described in detail.

C. Zimmermann.

Osterberg, G. **Application of x-rays in two cases of palpebral disease.** Acta Ophth., 1932, v. 10, pt. 3, p. 366.

A forty-three-year-old man suffering from lymphatic leukemia had bilateral conjunctivitis, with swelling and redness of the conjunctiva, profuse purulent secretion, and a marginal corneal ulcer. The condition resisted routine treatment for ten months. The patient was cured by one application of x-rays to the conjunctiva (20 percent skin erythema dose). Another patient, forty-one years of age, had suffered since childhood from bilateral ulcerative blepharitis and keratitis, complicated by bilateral ectropion. Two x-ray irirradiations, three weeks apart, cured the blepharoconjunctivitis, and improved the ectropion. *Ray K. Daily.*

Patry, André. **Cavernous angioma of the lacrimal gland.** Ann. d'Ocul., 1932, v. 169, June, pp. 458-464.

A tumor was removed from a four-year-old child through the upper lid. The mass contained both lymphangiomatous and hemangiomatous structures. (Three photomicrographs.)

H. Rommel Hildreth.

Petri, Mario De. **Gonotoxic dacryoadenitis.** Lettura Oft., 1932, Jan., p. 19.

Two cases of bilateral dacryoadenitis are reported, in individuals afflicted with gonorrheal urethritis, in one for one month, in the other for two months. The Wassermann test was negative in each case. The simultaneous, sudden, bilateral involvement, rapid and short course, absence of preexisting ocular disease, and negative bacterial findings for the gonococcus in the conjunctival sac induced the author to recognize a blood-borne gonotoxin, focal in the urethra, as the cause of this ocular condition. *F. M. Crage.*

Ploman, K. G. **On slitting the superior lacrimal canaliculus.** Acta Ophth., 1932, v. 10, pt. 3, p. 343.

In six cases of epiphora, with mutilated strictured canaliculi, the epiphora was relieved by slitting the upper canaliculi for 2 mm. The author attributes this action to enlargement of the punctum and its closer application to the globe. He suggests that this procedure be tried after dacryocystorhinostomy followed by persistent epiphora due to a mutilated lower canaliculus.

Ray K. Daily.

Rosenblatt, N. **Contrast phenomena in upper and lower lid.** Zeit. f. Augenh., 1932, v. 77, June, p. 341.

The author found in thousands of eyes that the conjunctiva of the lower lid was, without exception, darker, thicker, and its surface less delicate than that of the upper lid. The comparison is most easily made by everting both lids and inducing the patient to try gently to close the eye. The "common contrast phenomenon" is increased in chronic conjunctivitis. In acute inflammation the phenomenon is absent and its gradual return may be observed during healing.

F. Herbert Haessler.

Rosengren, Bengt. **A modification of Toti's operation.** Det oft. Selskab i København's Forhandlinger, 1931, pp. 24-47. In Hospitalstidende, 1932, May 19.

In exposing the tear sac and uncovering the nasal mucous membrane, Toti's technique is followed. To avoid the difficult and tedious procedure of suturing the membranes, the following method is used: The tear sac is dissected loose down to the lacrimal crest and cut off as far down as is possible. The medial wall of the sac is then slit upward to the ligament, and a suture is placed through the lateral wall of the tear sac so that the ends of the suture lie on the inside of the sac. A corresponding opening is made in the nasal mucous membrane. The ends of the suture are then passed into the nose through the opening in the nasal mucous membrane and the ends brought out and fastened on the cheek. In this way the tear sac is everted into the nasal opening and the edges of the respective membranes are brought into contact, thereby facilitating healing with the minimum of scar formation. The method has been used with good results in ten cases.

D. L. Tilderquist.

Subba Rao, P. R. **A case of Mickulicz's syndrome.** Proc. All-India Ophth. Soc., 1931, v. 2, p. 98.

The patient was a boy of sixteen years. The history dated back four and one-half years before he was first seen, when a swelling on the lateral side of each orbit appeared and proptosis resulted. The lids had to be sutured to keep the cornea covered. Practically all the glands of the body were involved. Biopsy of one of the glands revealed hyperplasia of the lymphoid tissue with much round cell infiltration, but no giant cells or eosinophiles. All laboratory and physical findings were negative. The author rules out such conditions as Hodgkin's disease and lymphosarcoma.

M. E. Marcove.

Tirelli, G. **Concerning congenital fistula of the lacrimal sac.** Rassegna Ital. d'Ottal., 1932, v. 1, nos. 1-2, pp. 66-75.

Tirelli describes a case of bilateral congenital fistula of the lacrimal sac in a twenty-year-old girl. Histological studies show that the fistulæ were not of inflammatory origin. The fistula probably arises from the lateral epithelium which buds from the fetal lacrimonasal duct, and becomes canalized and opened during intrauterine life, and is in contact with the cutaneous covering.

Serial sections from tissue removed at operation showed a bit of the fistulous tract and a portion of a small canal, which a little way from the cutaneous opening assumed a direction almost perpendicular to the surface. The rather large canal continuous with the external opening was contracted toward the lacrimal sac, assuming an oval form. This was covered by stratified pavement epithelium with cubical cells, regularly aligned toward the subepithelial connective tissue. From the skin side the epithelium of the duct suggested small papillary formations and the cells nearest the light were flat and keratinized. No hair-bearing follicles were found and no basement membrane was present. In the subepithelial connective tissue there were only a few lymphocytes and a few mast cells, but no plasma cells. There was therefore no true inflammatory reaction. Weigert's stain demonstrated a fine, delicate elastic tissue network about the epithelium of the canal.

Eugene M. Blake.

Vormann. **The question of Gunn's phenomenon.** Klin. M. f. Augenh., 1932, v. 88, June, p. 789.

A soldier aged twenty-three years showed during mastication a concomitant motion of the left upper lid, which was raised on opening the mouth and passively descended on closing the mouth. The affection is congenital and is probably due to abnormal connections between the third and fifth nerves or their nuclei. In some cases the facial nerve seems to play an intermediate part. *C. Zimmermann.*

Weekers, L. **The treatment of spastic entropion by palpebral injection of alcohol associated with canthotomy.** Arch. d'Opht., 1932, v. 49, July, p. 427.

About one-third of the cases of spastic entropion treated by alcohol injection alone have had a recurrence of the condition after several months. At present all cases which have existed over any length of time are treated by alcohol injection combined with canthotomy. This can be done without hospitalization and gives a more permanent effect. So far, seven cases have been so treated, that of longest duration being eighteen months, with no failure. By regulating the amount of alcohol and the extent of canthotomy according to the degree of entropion, the treatment may be judged to a nicety.

M. F. Weymann.

Zauli, G. **Bacterial flora of the conjunctiva before and after removal of the lacrimal sac in dacryocystitis.** Lettura Oft., 1932, Jan., p. 3.

The author's main interest was to make the conjunctiva as sterile as possible prior to intraocular operations. Eleven cases are reported, in which bacteriological studies were made before and after extirpation of the sac. Before removal of the sac all the cases showed pneumococcus and staphylococcus albus, rarely xerosis. From the beginning, extirpation caused a diminution in the number of organisms.

With proper medicinal treatment, the greatest number of cases can be made bacteria-free in from thirty to forty days after dacryocystectomy.

F. M. Crage.

15. TUMORS

Burch, F. E. **Orbital metastases from malignant tumors of the suprarenal.** Sec. on Ophth., Amer. Med. Assoc., 1931, 82nd session, pp. 113-129. (See Amer. Jour. Ophth., 1932, v. 15, July, p. 671.)

Castelli, A. **A case of retinal tumor.** Lettura Oft., 1932, March, p. 134.

The author describes a case of retinal tumor, with recurrence in the optic nerve eight months after enucleation, in a child of three and a half years. Pathologic examination showed metastasis in the nerve. This prompts the author to declare that extension in such cases occurs by way of the perineural lymph spaces. While the original tumor mass included choroid, iris, ciliary body, sclera, retina, and optic nerve, the retina suffered so much more destruction and replacement by the neoplastic elements that the tumor is called a malignant retinoma. Death from cerebral complications occurred eights months after orbital exenteration. *F. M. Crage.*

Gluck, Bernard. **Glioma of the optic nerve.** Brit. Jour. Ophth., 1932, v. 16, July, p. 406.

The case is unusual in the diagnostic problem presented and also in the fact that radium was used as the primary and only treatment. A female child had had the left eye removed, seven years previously. The margins of the lids had become adherent, and the contents of the orbit were tense and fluctuating. A cystic fluid was removed, stain injected, and the orbit radiographed. The picture showed an extensive cavity and masses in the orbit. Autopsy showed absence of the roof of the orbit, and there was a large cystic growth in the lower left frontal lobe. Sections of a piece of tissue from the orbit showed glioma. Seven years previously a deep orbital tumor had been treated with radium needles. The literature of the

subject is reviewed. (Four illustrations and eleven references.)

D. F. Harbridge.

Hird, R. B. **Papilloma of the lacrimal sac.** Brit. Jour. Ophth., 1932, v. 16, July, p. 416.

Of the three tumors, in as many patients, one grew from the caruncle and one from the palpebral conjunctiva. Both these were removed without return. The third was of the lacrimal sac. In this case the sac and growth were successfully removed without recurrence. When a child the patient had had conjunctival growths removed on five different occasions. *D. F. Harbridge.*

Holm, Eiler. **A case of orbital plasmocytoma.** Acta Ophth., 1932, v. 10, p. 334.

A woman seventy-three years of age presented herself with a small tumor on the floor of the right orbit. A roentgenogram demonstrated some erosion of the infraorbital border. The tumor was removed. She returned nine months later with a tumor in the left orbit, and a recurrence in the right. A roentgenogram at this time showed the tumor eroding the roof of the orbit. X-ray therapy failed to check the bone destruction, and the patient died from intracranial complications. Microscopically the tumor consisted of uniformly sized, sharply circumscribed cells, larger than a plasma cell; with numerous mitoses, some giant cells, numerous hemorrhages, and isolated necrotic areas. *Ray K. Daily.*

Jaensch, P. A. **Difficulties and errors in the diagnosis of sarcoma of the choroid.** Klin. M. f. Augenh., 1932, v. 88, May, p. 622. (Ill.)

Jaensch reports the clinical histories of five cases of sarcoma of the choroid the diagnosis of which was especially difficult. They had been under special treatment for various lengths of time without recognition of the tumors. On admission to the eye clinic of the University of Breslau they presented tenonitis, moderate exophthalmos, chemosis, and impeded painful movements of the diseased eyes. Ophthalmoscopic examination was impossible on account of opacity of the cornea, exudates and hemorrhages into the anterior chamber, and cataract. The tumor tenonitis was characterized by blindness, glaucoma, and tenonitis. The anatomical changes are described in detail. A case of angioma of the choroid is reported with enucleation of the eye on account of suspected sarcoma.

C. Zimmermann.

Kurz, Jaromir. **Atypical location of a choroidal sarcoma.** Oft. Sbornik, 1931, v. 6, pp. 241-243.

The left eye of a fifty-five-year-old woman was removed for what appeared ophthalmoscopically to be a tumor of the papilla. Histologically, it was a sarcoma of the choroid which had broken through Bruch's membrane into the retina and grown over the disc. (Four photographs.)

G. D. Theobald.

Marin-Amat, M. **Plexiform neuroma of the orbit.** Bull. Soc. Franç. d'Opht., 1931, 44th year, p. 594.

Marin Amat reports in detail the clinical and pathological findings in a case of plexiform neuroma of the orbit involving the upper lid and temporal region in a child of twenty-eight months. The tumor was removed completely and in a single piece. Postoperative convalescence was normal. Histological examination confirmed the clinical diagnosis. *Phillips Thygeson.*

Pressburger, Erich. **Dissemination of sarcoma in the eye.** Zeit. f. Augenh., 1932, v. 77, April, p. 82.

Dissemination differs from metastasis in that the former word designates the spread of tumor cells through a fluid within a cavity or in a cavity lined by a serous membrane. The author observed a patient in whom such dissemination of an iris sarcoma was observed on the lens capsule with the slitlamp and in histological preparations. The cells were much like the star-shaped cells which are the remains of the fetal vascular tunic and also those occasionally seen in iridocyclitis.

Choroidal sarcoma may be similarly disseminated in the subretinal space. The question of dissemination may be particularly difficult to evaluate in cases of sarcoma in a conjunctiva with multiple pigment areas. The author, in agreement with eminent consultants, advised exenteration of the orbit in such a case after biopsy had demonstrated a conjunctival mass to be sarcomatous. Upon histological study it was evident that the pigment areas were nonmalignant nevi. In this case abscission of lid and conjunctiva would have been enough.

F. Herbert Haessler.

Sabata, J. **Uveal angioma.** Oft. Sbornik, 1931, v. 6, pp. 205-208.

In a male aged twenty-six years, three angiomata were found in the iris of the left eye. One extended back into the choroid. The eye was not removed. On the right lower lid there was a carcinoma following an injury.

G. D. Theobald.

Samuels, Bernard. **Some notes on orbital tumors.** Arch. of Ophth., 1932, v. 7, June, pp. 868-883.

The first group includes tumors of slow growth, producing marked inflammatory reaction—carcinoma and cylindroma; group two includes those of rapid growth, producing little or no inflammatory reaction—sarcoma, hemangioma, and neurofibroma; group three includes tumors of the optic nerve—endothelioma and glioma; group four includes tumors invading the retrobulbar region by extension from within, and intraocular tumors escaping through the sclera without producing inflammatory reaction; group five includes metastatic tumors of the orbit—carcinoma and sarcoma; group six, inflammatory tumor of the orbit; group seven, enigmatic cases of exophthalmos which anatomically divulge no pathologic process. (Drawings and case reports.)

M. H. Post.

Shannon, C. E. G., and McAndrews, L. F. **Lymphomas of the conjunctiva.** Amer. Jour. Ophth., 1932, v. 15, Sept., pp. 821-825.

Stepka, J. **Unusual course of an orbital tumor.** Oft. Sbornik, 1931, v. 6, pp. 237-240.

Six years ago, a female aged forty-six years had first symptoms of headache, the left eye tearing, and slight exophthalmos. V=6/7.5. In the course of a year the exophthalmos increased; and, because operation was refused, she was treated with x-ray and radium, whereupon the tumor symptoms diminished. Recently, very extensive growth of the tumor and exacerbation of all symptoms set in, with loss of vision and marked tenderness. Exenteration revealed a large dermoid cyst deep in the orbit, with a pedicle attached to the wall. The diagnosis was confirmed histologically. (Bibliography.)

G. D. Theobald.

16. INJURIES

Frenkel, Henri. **Concerning annular cataract of Vossius due to contusion. A critical study.** Arch. d'Opht., 1932, v. 49, July, p. 431.

The assumption that annular opacity upon the lens following contusion is due to iris pigment and injury from the iris being pressed against the lens is correct, but the mechanism of this forced contact is erroneously described as due to forcing backward of the cornea and iris against the lens by the blow upon the eye. The mechanism may be explained as follows: The blow upon the eye causes rupture of the zonule, and as pressure is released the rebound of the posterior segment forces the partially freed lens forward against iris and cornea. The stretching of the pupil so produced causes tears of the sphincter, other lesions of the iris, or even iridodialysis. The traumatism paralyzes the short ciliary nerves, producing mydriasis. Hemorrhage from the iris may cause hyphema. Pigment from the posterior surface of the iris may be impressed upon the lens capsule and small ruptures in the capsule may lead to partial cataract. The lens may return to its normal position or remain subluxated. *M. F. Weymann.*

Key, B. W. **Extensive iridodialysis; operation; reattachment.** Arch. of Ophth., 1932, v. 7, May, pp. 748-756.

The operative procedure for this condition is carried out by the author in the following manner: A large conjunctival flap is made; under moderate dilatation a keratome incision 4 mm. long, just outside the limbus, is made over the center of the dialysis. The iris is withdrawn and transfixed from behind forward by a doubly armed suture, after which the same needle is passed through the scleral tip of the corneoscleral section and both needles brought out through the conjunctiva. The suture is then tied. Finally, the conjunctival flap is sutured in place. Should a membranous cataract exist binding the torn iris to the pupil, discission must be practiced first. Excellent results were obtained in the two cases operated upon, though in the second somewhat excessive incarceration of the iris occurred following filtration of aqueous after removal of sutures on the fourth day. *M. H. Post.*

Kiehle, F. A. **Aftermath of cases of intraocular foreign body.** Trans. Pacific Coast Oto-Ophth. Soc., 1931, 19th annual meeting, pp. 107-113. (See Amer. Jour. Ophth., 1932, v. 15, July, p. 675.)

Knobloch, R. **A statistical report concerning superficial eye injuries.** Oft. Sbornik, 1931, v. 6, pp. 212-219.

At the Czech clinic in Prague, during a ten-year period, there were 15,465 cases of injury to the anterior part of the eye (8.6 percent of all cases). The author classifies these according to age, eye (right or left), month, etiology, location and vocation. The injuries include (1) erosion of the cornea, (2) nonperforating wound of the cornea or (3) of the sclera, (4) foreign body in the cornea or (5) in the sclera, (6) traumatic keratitis, (7) recurrent erosion of the cornea, (8) simple traumatic ulcer of the cornea, (9) serpent ulcer, (10) abscess of the cornea, (11) disciform keratitis, and (12) posttraumatic herpes of the cornea. The author also reports two cases of serpent ulcer, one occurring after injury by a fish hook, the other after injury with a needle which had been used to open a boil, the smear showing a pure culture of staphylococci. *G. D. Theobald.*

Lambert. **Contribution to the study of contusions of the globe in military medicine.** Arch. d'Opht., 1932, July, v. 49, p. 439.

Three cases of ocular contusion, two of which had penetrating wounds, are described as examples of the type of injury observed by a surgeon at a military post at Strasbourg during eighteen months service. *M. F. Weymann.*

Mattos, W. B. **Intraocular foreign bodies.** Rev. de Ophth. de São Paulo, 1932, v. 1, March, pp. 223-227.

Five cases are reported to illustrate the results obtained by accurate localization and removal with the giant magnet. The author does not believe in the existence of sympathetic ophthalmia. *W. H. Crisp.*

Oppenheimer, E. H. **A limbus loop for extraction of foreign bodies.** Klin. M. f. Augenh., 1932, v. 89, July p. 88. (Ill.)

This loop is built like that of Weber for cataract extraction, but smaller, flatter and firmer. It is pressed around the foreign body on the limbus for producing local anemia to avoid disturbing hemorrhage from the ciliary vessels. *C. Zimmermann.*

Rolett, Daniel. **Two cases of ocular injury by methyl-violet pencils.** Klin. M. f. Augenh., 1932, v. 89, July, p. 52. (Ill.)

Two cases are reported in detail. They fully recovered because the poison remained in the eyes for only a short time. Methyl violet causes immediate and permanent, especially ciliary, pain. The corneal epithelium shows special sensitiveness, as evidenced by the rapid necrosis and blue staining of the parenchyma. This with staining of the iris and a wine-red color of the fundus, demonstrated the diffusing effect of the poison. The course of the disease is slow in spite of treatment. The dangers and complications are manifold and threatening, commencing with slight iritis and progress-

ing through cyclitis and retinitis to complete blindness. The longer the poison acts the more unfavorable is the prognosis for treatment. Best is thorough removal of the fragments, frequent irrigation with from five to ten per cent solution of tannic acid or ten per cent peroxide of hydrogen, and decoloration of the stained places by touching them with cotton soaked in ninety-six percent alcohol.

C. Zimmermann.

Vasek, Emil. **Foreign body in the optic nerve.** Oft. Sbornik, 1931, v. 6, pp. 209-211.

A piece of iron penetrated the left eye through the upper temporal part of the sclera behind the ciliary body, passed through the vitreous humor, pierced the optic disc near its temporal border, and remained in the optic nerve, injuring the vessels. The foreign body could not be seen, but was accurately localized by the course of the two scleral wounds, the appearance of the disc, and skiagraphy. The patient refused enucleation. The author discusses the possibilities of siderosis and sympathetic ophthalmia.

G. D. Theobald.

Verhoeff, F. H. **Concerning magnetic intraocular foreign bodies and their removal.** Amer. Jour. Ophth., 1932, v. 15, Aug., pp. 685-689.

17. SYSTEMIC DISEASES AND PARASITES

Angelucci, A. **The endocrines in the congenital mechanism of the status lymphaticus in relation to adenoidism.** Ann. di Ottal., 1932, v. 60, Feb., p. 141.

As the thymus exercises a marked control over the status lymphaticus in childhood, so lutein secretion influences the female cycle. Frequently the adenoid trachomatous child is vagotonic, deficient in calcium, with narrow thorax, narrow skull, neck often short, palate oval, and limited nasal respiration. The eyes are particularly affected, the palpebræ are tumid, the conjunctivæ hyperemic, with mucous congestion and exudation. Not infrequently the cornea is involved with vascular proliferation. These conditions conduce to craniofacial changes involving the eye.

Park Lewis.

Arruga, H. **Ocular diabetes.** Arch. de Oft. Hisp.-Amer., 1932, v. 32, July, p. 356.

Most cataracts in diabetics are senile. The pure diabetic cataract, as seen in the young, begins in the form of anterior and posterior subcapsular thin, opaque layers composed of small and medium sized floccules, is followed by vacuoles and water clefts, and terminates in nuclear sclerosis with formation of black cataract. In extraction of this form, particularly in patients under the influence of insulin, there is difficulty in securing mydriasis, there is escape of brown aqueous from dropsical degeneration and vacuolization of the pigment layer of the iris, slow healing, and pigmentation of secondary cataract or else of vitreous to contend with. Pure diabetic iritis responds very poorly to atropin, particularly if insulin is being administered, but reacts well to glaucosan. Rubeosis of Salus was observed in two cases and a cut of one accompanies the article. No nodules, but only punctate deposits, have been observed in iritis. Twelve cases of retrobulbar neuritis were seen and the writer believes it is often overlooked. Transitory myopia and hyperopia have been observed. No ocular manifestations contraindicate the use of insulin, but they are often little benefited by it. A cut of dropsical degeneration of the pigment layer of the iris is given.

M. Davidson.

Lane, L. A. **Practical points in ophthalmic practice. A study of recent food researches.** Sec. on Ophth., Amer. Med. Assoc., 1931, 82nd session, pp. 149-171. (See Amer. Jour. Ophth., 1932, v. 15, May, p. 487.)

Lauterer, Z. **Two cases of pseudosclerosis.** Bratislavske Lekarske Listy, 1932, v. 12, pp. 326-345.

Two brothers, aged thirty and twenty-eight years, presented similar clinical symptoms; trembling, considerable disturbance of speech, dimin-

ished muscular tone with the exception of the rigidity of expression, and diminished reflexes of the extremities. In both patients the Kayser Fleischer pericorneal ring was distinctly seen. Another brother, aged thirteen years, had pseudosclerosis, and still another, aged fourteen years, had Wilson's disease; both died later from shock. All four brothers suffered from secondary rickets from eleven to fourteen years of age, which left deformities behind. A disease similar to pseudosclerosis had affected two maternal relations of the patients.

Lourie, O. R. **Abuse of the theory of focal infection.** Arch. of Ophth., 1932, v. 8, July, pp. 24-30.

The author concludes that the beneficial results from removal of such foci "are insignificant in comparison with the sacrifices involved." Mass removal of tonsils has been carried out in the hope of eliminating rheumatic and other infections, but the practice of medicine is not experimentation in a laboratory, and insufficient knowledge should not be taken as an indication for operation. *M. H. Post.*

Mura, F. **Echinococcal cyst of the orbit.** Ann. di Ottal., 1932, v. 60, Feb., p. 125.

Echinococcal cyst localized in the orbit is so rare that of 20,900 cases it was discovered in only three. A child of ten years suffered a contusion of the left eyeball. Some months later, the eyeball protruded upward, causing diplopia, and had limited motion in every direction except outward. Palpation of the lower lid disclosed a firm elastic neoplasm. Serodiagnosis of Ghedina was positive for echinococcus. A cyst the size of a small egg was removed, and uneventful recovery followed. The second case occurred in a man of sixty-four years, with proptosis and pain. The third was in a girl of nineteen years. She lived on a dairy farm and the family had always kept dogs. A marked difference was found in the number of eosinophiles in the blood in the vicinity of the cyst. (Bibliography and plates.) *Park Lewis.*

Neves, Mascarenhas. **Dental examination and therapy in the light of ophthalmology.** Arquivos do Instituto Penido Burnier, 1932, v. 1, March, pp. 80-95.

This is a general consideration of the subject of dental infection as related to the eye, along lines familiar in the United States, but apparently less generally understood in Brazil. The author is in favor of radical treatment of all definitely recognized dental infections. (Illustrated.) *W. H. Crisp.*

Ruedemann, A. D. **Ductless glands as they appertain to eye diseases and to surgery.** Sec. on Ophth., Amer. Med. Assoc., 1931, 82nd session, pp. 191-198. (See Amer. Jour. Ophth., 1932, v. 15, March, p. 287.)

Santonastaso, A. **The behavior of the light sense in ophthalmoscopic examination of eclamptic woman with particular reference to hepatic function.** Ann. di Ottal., 1932, v. 60, March, p. 183.

Diminution of light sense with changes in retinal pigmentation was found associated with hepatic disturbance. This is accentuated in the toxemia of eclampsia, where hepatic insufficiency is more marked. In eighteen cases, some before, others after an eclamptic attack, not only a lowering of the light sense but retinal pigmentary changes were noted with some frequency. These were of the nature of depigmentation, in some cases diffuse, in others in spots or in zones of hyperpigmentation not indicating progressive detachment but in many instances indicating migration of pigment cells. The luminosity tables of de Wecker and the Foerster photometer were employed. The writer concludes that, as the light sense is reduced in normal pregnancy, it is proportionately reduced to a greater degree in eclampsia, and that a considerable period of time may elapse before the retinal elements function normally. *Park Lewis.*

Santonastaso, A. **Ocular changes in leprosy.** Ann. di Ottal., 1932, v. 60, Feb., p. 107.

This is a continuation of previous papers. (See American Journal of Ophthalmology, 1932, July, page 679.) In this issue are considered differential diagnosis; involvements of the lens, fundus, of visual field, and visual acuity; and therapy. *Park Lewis.*

Silva, C. A. **Examination of the mouth for a focus of infection in relation to the eyes.** Rev. de Ophth. de São Paulo, 1932, v. 2, June, pp. 5-7.

The author, a dental radiologist, suggests that it is not sufficient to depend upon x-ray examinations of the teeth, but that conclusions should only be arrived at upon the combined basis of (1) the clinical examination, (2) examination as to vitality of the dental pulp, (3) transillumination, and (4) the radiographic examination.

W. H. Crisp.

Thies, Oscar. **The female cycle and the eye.** Klin. M. f. Augenh., 1932, v. 88, June, p. 727. (Ill.)

As pointed out by Novak, hormonal, toxic, nervous, and circulatory influences contribute the causal connection between the female sexual organs and predisposed eyes. The author illustrates the dependence of ocular affections of the female cycle upon endocrine disturbances, discussing the influence of menstruation, amenorrhea, dysmenorrhea, acromegaly, disease of the hypophysis, and successful organotherapy in such cases. Two cases of bilateral iritis due to anomalies of menstruation are described in detail. Eye affections in pregnancy, the puerperium, lactation, and the climacteric are also considered. (Two clinical histories.) *C. Zimmermann.*

Urbanek, J., and Meller, R. **Demonstration of tubercle bacilli in the blood of patients with ocular disease.** Zeit. f. Augenh., 1932, v. 77, April, p. 17.

By blood culture and animal inoculation, the authors sought for tubercle bacilli in the blood of seventy patients with presumably tuberculous eye disease. For culture the blood was drawn into acetic acid or citrate solution and the sediment spread directly on glycerine-potato medium. For inoculation thirty c.c. of citrated blood was washed once and injected subcutaneously and intraperitoneally into guinea pigs. In sixty-two patients the findings were entirely negative. In one case blood culture was positive. Three animal inoculations demonstrated the presence of tubercle bacilli, while in the others the authors merely relied on specific reactions for diagnosis.

F. Herbert Haessler.

18. HYGIENE, SOCIOLOGY, EDUCATION, AND HISTORY

Derby, G. S. **The need of medical social service in eye clinics.** Sec. on Ophth., Amer. Med. Assoc., 1931, 82nd session, pp. 296-299. (See Amer. Jour. Ophth., 1932, v. 15, May, p. 489.)

Hessberg, R., **Monocular blindness and consequent diminution of earning power.** Klin. M. f. Augenh., 1932, v. 88, June, p. 767.

Hessberg concludes that an eye with a remnant of vision is to be considered practically blind, if the amount of vision is not sufficient for orientation and cannot be utilized for binocular stereoscopic vision, that is, if only hand motions can be recognized. The condition, however, of the transparent parts of the eye, the peripheral and central visual fields, light sense, and so on, must not be neglected. Practical blindness also may eventually exist in cases with a greater remnant of central vision, if its use is curtailed by other functional disturbances, in visual field or light sense, or by the special occupation of the injured person.

C. Zimmermann.

James, R. R. **A seventeenth century letter dealing with ophthalmic matters, etc.** Brit. Jour. Ophth., 1932, v. 16, July, p. 427.

These two letters, written to patients in 1636, by Dr. John Symcottes, contain advice and suggestions for the use of remedies of that period. In a particularly naïve manner the doctor expresses his displeasure at irregular practitionors. *D. F. Harbridge.*

One hundred years of schooling of the blind. Outlook for the Blind, 1932, v. 26, June, p. 73.

This paper is a description of the founding and growth of the three pioneer schools for the blind, the New York Institute for the Education of the Blind in New York City, the Perkins Institution and Massachusetts School for the Blind at Boston, and the Pennsylvania Institution for the Instruction of the Blind at Philadelphia. The change of attitude toward these schools since their founding is shown by the fact that their control has passed from departments of charity to departments of education. Graduates of these schools have been able to compete successfully with seeing individuals in their chosen fields. Notable graduates include Frances Jane Crosby, Miss Sullivan, and Helen Keller.

Ralph W. Danielson.

Rabkin, E. **Ophthalmology in Ukraine.** Arch. of Ophth., 1932, v. 7, May, pp. 769-772.

This paper gives a brief report of diseases of the eye as found in Ukraine, the status of ophthalmology as to the number of physicians, clinics, hospitals, societies, methods of health education, and the possibilities for training in the specialty of ophthalmology. Previous to the war there was no ophthalmic journal, there were from 150 to 200 oculists and few ophthalmic institutes. Now there are four medical schools with ophthalmic departments, and four eye clinics, which are parts of institutions for the instruction of physicians in ophthalmology. There is one ophthalmic institute with 102 beds, two special eye hospitals and 42 ophthalmic departments. There are about 500 oculists. Trachoma is being studied extensively. An eye journal was started in 1929,* and an ophthalmological congress was held at Kharkov at the same time. One eye bed is allowed for each 10,000 of the population in industrial centers, one for each 15,000 in cities and one for each 2,000 in villages. No payment is made for consultation, treatment, and so on. It is proposed to double the number of ophthalmologists in the next few years. The second Ukrainian ophthalmological congress will take place in 1933. Physicians are sent periodically by the public health department to foreign countries for research and study.

M. H. Post.

* But seemingly continued only a few months. At present there is only one eye journal for the whole of Russia.—Editor.

Samuels, Bernard. **The foundation of the New York Eye and Ear Infirmary.** Arch. of Ophth., 1932, v. 7, May, pp. 681-699.

This paper contains a fascinating account of the early days of ophthalmology in New York and hints at contemporaneous developments in Boston and Philadelphia. It depicts briefly the struggles of the founders of the Infirmary and gives a brief, but interesting, sketch of the three men whose names are most intimately linked with its beginnings, namely, Colonel William Few, first president of the institution, and at one time mayor of New York, Dr. John Kearney Rodgers, and Dr. Edward Delafield.

M. H. Post.

Talbot. **Prophylaxis of pandemic trachoma.** Rev. Internat. du Trachôme, 1932, v. 9, July, p. 127.

Talbot presents statistics involving 1,864 cases of florid trachoma in school children of southern Tunisia. After operative intervention (expression of granulations), followed by daily application of a caustic, the index of active trachoma was reduced in one school year from 48.9 to 12.3 percent. In ten years of conscientious effort it should be possible to sterilize all cases of active trachoma in the schools, and also to treat effectively at least 25,000 women and 20,000 children not in school by means of dispensaries. The prophylaxis of pandemic trachoma is no less hopeful and no less obligatory than the prophylaxis of tuberculosis and syphilis.

Phillips Thygeson.

NEWS ITEMS

The Editor of this column would appreciate news items which subscribers to the Journal believe would be of interest to its readers. News items should reach **Dr. Melville Black, 424 Metropolitan building, Denver,** by the twelfth of the month.

Deaths

Dr. Charles Abadie, dean of French ophthalmology, died recently at the age of ninety years.

Dr. Newman R. Donnell, St. Louis, aged sixty years, died on September 23rd, of cardiac disease following a six months' illness. He had been very active in his profession being especially interested in clinical ophthalmology, both in private practice and in his teaching position on the faculty of St. Louis University Medical School.

Dr. Edw. H. Schild, Canton, Ohio, aged sixty-five years, died of angina pectoris after an illness of one week's duration. Graduated from the University of Maryland Medical School in 1900 he served on the staff of the Baltimore Eye and Ear Hospital and in the out-patient department of Johns Hopkins Hospital until he moved to Canton.

Miscellaneous

The Park Lewis Hall at the New York State School for the Blind, Batavia, was dedicated September 22nd by Lieut. Governor Herbert H. Lehman.

Trachoma dispensaries are being established in centrally located cities and towns of trachoma infested areas in Turkey. Every dispensary is to have a specialist physician, sanitary inspectors, a secretary and, if necessary, an assistant physician.

The Children's Fund of Michigan will establish an eye clinic in Iron County. All children of the schools will be examined and children of indigent parents will be furnished glasses free. Other children will be recommended for treatment by their physicians

Societies

A Chinese Ophthalmological Society was recently organized at the Peiping Union Medical College. Dr. Hua-teh Pi was elected president and Dr. Shih-pu Chang, secretary.

The Thirty-seventh Annual meeting of the American Academy of Ophthalmology and Otolaryngology was held in Montreal the week of September 19th. Considering the depression and the remote place of meeting, the registration of over five hundred may be considered very satisfactory. Boston was chosen for the next meeting place. Dr. Burt R. Shurley, of Detroit, was elected president. In the Graduate Course, some lectures were overcrowded and others very poorly attended. Known popular subjects might be given to more than one man, as many in fact as would be thought sufficient to supply the demand. The committee, by this time, should be aware of what subjects are most popular.

At the meeting of the American Ophthalmological Society in New London in June, 1932, the following officers were elected:

President: Dr. Thomas B. Holloway.

Vice-president: Dr. W. Gordon M. Byers.

Secretary-treasurer: Dr. J. Milton Griscom.

Editor of Transactions: Dr. Bernard Samuels.

All communications relative to the Transactions should be addressed to the Editor, Dr. Bernard Samuels, 57 West 57th street, New York City.

The Pacific Coast Oto-Ophthalmological Society met in Seattle on June 30-July 2, 1932. Dr. Walter F. Hoffman presided.

This twentieth annual meeting of the Society was attended by 117 members and guests. The part of its proceedings devoted to ophthalmology included papers and discussions dealing with subjects of new and important practical interest. The address of the President, Dr. Walter F. Hoffman, of Seattle, dealt with the economic situation confronting the medical profession; considering facts as they are and changes likely to come. It will be published in an early number of the Journal. The scientific papers that followed brought out active and interested discussions.

The paper on Vision in Orientation and Equilibrium by Edward Jackson will be published later in this Journal. A case of Agranulocytic Angina Complicated by Bilateral Ring Abscess of the Cornea was reported by Hans Barkan of San Francisco. This case was remarkable in, that under treatment, the patient recovered from the angina, although both eyes were lost by the corneal abscesses.

The paper by John E. Weeks, of New York and Portland, on Treatment of Corneal Infections, will be published in full. Its practical character provoked discussion from a dozen members, who came from as many cities, ranging from Minneapolis to Los Angeles. The paper on Hysterical Amblyopia, by Cordes and Horner of San Francisco, was read by Dr. Horner and discussed by seven speakers who represented an equally wide range of experience and geographic distribution. Two unusual Cataract Cases, in which the old suction operation was used, were presented by M. J. Keys of Victoria, B.C.

There was a presentation of motion pictures of Cataract Operations by C. N. Spratt, of Minneapolis. There was also a report of

two cases of Extreme Bilateral Exophthalmos and Autopsy Findings by H. G. Merrill, of Provo, Utah. This paper included a bibliography of similar cases that have been found scattered through the literature. It calls attention to an important clinical entity heretofore not clearly recognized and understood. It will also appear in an early issue of this Journal.

The round table discussions held at luncheons were an important part of the scientific work of the meeting. Each was attended by eight or ten members, most of whom shared in the discussion. Those subjects concerned with ophthalmology were: Vitreous Opacities, led by Hans Barkan; Allergic Disturbances of Eye, R. L. Benson; Position and Interpretation of X-ray Pictures, H. S. Nichols; Muscle Operations, Roderic O'Connor; Malingering Tests, W. K. Seelye; Use of Slit Lamp, Will Otto Bell; The Fundus in Cerebral Diseases, D. G. Dickerson; Failures in Refraction, W. D. Horner; Pre- and Post-Operative Orders, Clarence A. Veasey; Perimetry, C. B. Walker; Treatment of Chronic Conjunctivitis, John E. Weeks. Some of these subjects were so popular that the round tables for them were repeated.

Striking features of the meeting were the exhibition of about 250 pictures of eye conditions by H. V. Würdemann; and the address of Prof. Trevor Kincaid, Department of Biology, University of Washington, on The Development of the Eye. The latter was substituted for after-dinner speeches at the Annual Banquet.

Recreation was not neglected. There was opportunity for golf every afternoon, and excursions by automobile, boat and airplane gave fine opportunity to see the Puget Sound Region. At the time for the Annual Banquet a special entertainment was provided for the ladies.

This meeting must rank as a successful special gathering, in a year of general financial depression, keenly felt by most members of the medical profession.

Personals

Dr. David A. Strickler, Denver, announces the removal of his offices from the Republic building to his residence in Denver.

Dr. Walter Parker of Detroit attended the jubilee of the French Ophthalmological Society as an invited guest. A large number of guests were present from all over the world. It presented much the appearance of an International Congress. Between seventy and eighty papers were read.